Odrednice ranog postoperacijskog funkcionalnog statusa nakon operacije prijeloma kuka starijih od 65 godina

/ Determinants of Early Postoperative Functional Status After Hip Fracture Surgery in Patients over 65 Years Old

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Prijelom kuka je jedan od najtežih prijeloma u starijih osoba. Povezan je s visokim stopama smrtnosti, morbiditeta i invaliditeta te je ekonomski opterećujući za bolesnike, njihove obitelji i sustav zdravstvene zaštite. Zato je, uz preventivne mjere koje mogu smanjiti incidenciju padova i prijeloma, vrlo važno identificirati one čimbenike koji mogu olakšati postoperacijski funkcionalni oporavak kod prijeloma i posljedične operacije. Glavni cilj provedenog istraživanja bio je utvrditi najvažnije odrednice uspješnosti funkcionalnog oporavka neposredno nakon operacije prijeloma kuka u starijih osoba, odnosno ispitati i usporediti prediktivne doprinose čimbenika iz triju različitih skupina (sociodemografskih, zdravstvenih i funkcionalnih te psihosocijalnih) uspješnosti funkcionalnog oporavka starijih osoba neposredno nakon operacije kuka, tj. na dan izlaska iz bolnice. U istraživanju je sudjelovalo 150 pacijenata, u dobi od 65 do 99 godina (M = 81,63, SD = 8,11) hospitaliziranih zbog operacije prijeloma kuka, od čega 35 muškaraca i 115 žena. Podatci o potencijalnim prediktorima uspješnosti postoperacijskog funkcionalnog oporavka prikupljeni su na dan prijma u bolnicu, a podatci o postoperacijskom funkcionalnom statusu na dan otpusta iz bolnice. Funkcionalni status ispitan je Barthelovim indeksom. Rezultati istraživanja pokazuju značajnu ulogu sociodemografskih obilježja, ranijeg funkcionalnog statusa te ranije uključenosti u napornije tjelesne aktivnosti u postoperacijskom funkcionalnom oporavku starijih osoba neposredno nakon operacije prijeloma kuka. Rezultati ne potvrđuju veću ulogu ispitanih psihosocijalnih resursa (mentalnog zdravlja, otpornosti i socijalne podrške) u funkcionalnom oporavku neposredno nakon operacije. Identificiranje i osnaživanje onih čimbenika koji mogu olakšati oporavak pacijenata nakon operacije prijeloma kuka izuzetno je važno jer može ubrzati njihov oporavak i, općenito, pridonijeti njihovoj kvaliteti života, ali i smanjiti opterećenje zdravstvenog sustava.

/ Hip fracture is one of the most severe fractures in elderly individuals. It is associated with high rates of mortality, morbidity and disability, representing an economic burden for the patients, their families and the healthcare system. For this reason, in addition to the preventive measures that could reduce the incidence of falls and fractures, it is important to identify the factors that could facilitate the postoperative functional recovery after a fracture and the consequent surgery. The main aim of the conducted study was to identify the most important determinants of successful functional recovery immediately after hip fracture surgery in elderly individuals, i.e. to examine and compare the predictive contributions of factors from three different functional recovery performance groups (sociodemographic, health and functional, and psychosocial) among elderly individuals immediately after hip surgery, i.e. on the day of discharge from the hospital. The study involved 150 patients between 65 and 99 years of age (M = 81.63, SD = 8.11) hospitalized for hip fracture surgery, of whom 35 were male and 115 were female. Data on the potential predictors of successful postoperative functional recovery were collected on the day of hospital admission, while data on the postoperative functional status were collected on the day of hospital discharge. The Barthel Index was used to assess the functional status. The study results point to a significant role of sociodemographic characteristics, previous functional status and previous involvement in more strenuous physical

activity in the postoperative functional recovery of elderly individuals immediately after hip surgery. The results do not confirm a greater role of the examined psychosocial resources (mental health, resilience and social support) in the course of postoperative functional recovery. The identification and strengthening of the factors that could facilitate patients' postoperative recovery after hip fracture surgery are of extreme importance, since they could accelerate their recovery and, generally, contribute to their quality of life, as well as lessen the burden on the healthcare system.

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UVOD

U starijoj populaciji povećanjem dobi obično dolazi do opadanja funkcionalne sposobnosti koja se odnosi na sposobnost samostalnog izvođenja aktivnosti svakodnevnog života i samozbrinjavanja kao što su samostalno hranjenje, odijevanje, kupanje, kretanje i dr. Očuvana funkcionalna sposobnost iznimno je važna jer je značajno povezana s višim razinama zadovoljstva životom (1,2), dok se s druge strane ovisnost osoba o pomoći drugih negativno odražava na njihovo zadovoljstvo životom (3). Ako se sposobnost samostalnog funkcioniranja znatnije reducira, osoba će trebati pomoć i njegu u kući (4).

Ono što može bitno narušiti funkcionalni status starije osobe jesu posljedice prijeloma zbog pada. Pad se definira kao iznenadna, nenamjerna promjena položaja tijela koja dovodi osobu na nižu razinu, predmet, pod ili zemlju, a isključuje namjernu promjenu položaja tijela (5). Padovi i prijelomi su značajan problem za stariju populaciju. Svake godine pad doživi 28-35 % osoba starijih od 65 godina, a za osobe starije od 70 godina broj

INTRODUCTION

In the elderly population, with increasing age there is usually a decline in functional capacity related to the ability to independently perform everyday activities and self-care, such as self-feeding, dressing, bathing, moving etc. Preserved functional capacity is of extreme importance as it has a significant correlation to higher levels of life satisfaction (1, 2), while on the other hand, dependence on the help of others has a negative impact on life satisfaction (3). Should the capacity to function independently significantly reduce, the individual will require help and in-home care (4).

The consequences of fractures due to a fall can significantly impair an elderly individual's functional status. A fall is defined as a sudden and unintentional change in body position resulting in an individual landing at a lower level, on an object, the floor, or on the ground, and excludes intentional change of body position (5). Falls and fractures are a major problem among the elderly population. A total of 28%-35% of individuals over 65 years of age experience a fall each year, while for those older than 70 the percentage ris-

raste na 32-42 % (5). Primjerice, u Hrvatskoj su 2017. godine od ukupnog broja hospitaliziranih pacijenata s prijelomom, 84 % činile osobe starije životne dobi, a od ukupnog broja umrlih zbog prijeloma, 99 % su bile osobe u dobi od 65 ili više godina. Nadalje, prema podatcima Hrvatskog zavoda za javno zdravstvo 2017. godine su vodeći uzroci smrti od ozljeda, kao i vodeći uzrok hospitalizacija starijih osoba bili padovi (6).

Padovi starijih osoba rezultiraju posljedicama koje narušavaju njihovu kvalitetu života, a najčešće posljedice pada su prijelomi, strah od pada koji se javlja u oko 90 % osoba koje su pale, odustajanje od dosadašnjih aktivnosti, promjena navika i imobilizacija (7). Prijelom kuka česta je i ozbiljna posljedica padova i osteoporoze u starijih osoba s prevalencijom u porastu u populaciji koja kontinuirano stari (8,9). Prijelom kuka smatra se jednim od najtežih prijeloma u starijih osoba. Prijelomi kuka povezani su s visokim stopama smrtnosti, morbiditeta i invaliditeta, a jednogodišnje stope smrtnosti kreću se od 14 % do 58 % (10,11). Prijelomi također ekonomski opterećuju bolesnike, njihove obitelji, sustav zdravstvene zaštite, pružatelje usluga i širi zdravstveni sustav (12,13). Posljedice padova i prijeloma kuka često uključuju bol, strah, nesigurnost, anksioznost, depresiju, ali i ozbiljne fizičke ozljede koje mogu dovesti i do smrti (14). Stoga je, uz preventivne mjere koje mogu smanjiti incidenciju padova i prijeloma, vrlo važno identificirati i one faktore koji mogu olakšati postoperacijski funkcionalni oporavak u slučaju prijeloma i posljedične operacije.

Dosadašnja istraživanja oporavka nakon operacije prijeloma kuka uglavnom su se usmjeravala na osnovne sociodemografske te tjelesne čimbenike ili čimbenike povezane s funkcionalnim statusom, npr. doživljaj boli te raniji funkcionalni ili zdravstveni status. Ta su ranija istraživanja pokazala da se mlađe osobe, one višeg socioekonomskog statusa, općenito boljeg zdravstvenog stanja, očuvanih kognitivnih funkcija, te osobe koje žive s bračnim partnerom, brže oporavljaju od ozljede loma kuka, kao i osobe koje su imale

es to 32%-42% (5). For example, the statistics for Croatia in 2017 showed that among the total number of patients hospitalized due to fracture, 84% were elderly individuals, while 99% of the deaths due to fracture consisted of patients aged 65 or older. Furthermore, according to the data from the Croatian Institute of Public Health for 2017, falls were the leading cause of death due to injury, as well as the leading cause of hospitalizations among the elderly (6).

Falls among the elderly result in consequences that impair their quality of life, and the most common consequences of a fall include fractures, fear of further falls which occurs in 90% of individuals who have experienced a fall, giving up previous activities, change in habits, and immobilization (7). Hip fracture is a common and serious consequence of falls and osteoporosis in the elderly, with increasing prevalence among the population that is continuously aging (8, 9). Hip fracture is considered as one of the most severe fractures in elderly individuals. Hip fractures are associated with high rates of mortality, morbidity and disability, with one-year mortality rates between 14% and 58% (10, 11). Fractures also constitute an economic burden for the patients, their families, the healthcare system, service providers and the overall health system (12, 13). The consequences of falls and hip fractures often include pain, fear, insecurity, anxiety, depression, as well as serious physical injuries that can potentially lead to death (14). For this reason, in addition to the preventive measures that could reduce the incidence of falls and fractures, it is important to identify the factors that could facilitate the postoperative functional recovery after a fracture and the consequent surgery.

The studies on postoperative recovery after hip fracture surgery conducted so far mainly focused on the basic sociodemographic and physical factors or factors associated with the functional status, e.g. the sensation of pain and previous functional or health status. These earlier studies have shown that younger individuals, those of higher

bolji funkcionalni status prije same ozljede (15-19). Pritom se raniji funkcionalni status pokazuje jednim od najsnažnijih prediktora postoperacijskog oporavka funkcionalne sposobnosti ili aktivnosti svakodnevnog života (20-23).

Istraživanjima je dobro potvrđena važnost tjelesne aktivnosti za očuvanje funkcionalne sposobnosti i prevenciju padova u starijoj dobi. Kontinuirano provođenje tjelesne aktivnosti smatra se jednom od najboljih metoda za očuvanje funkcionalne sposobnosti te sprječavanje i ublažavanje promjena i bolesti koje dolaze sa starijom životnom dobi (24). Fizička aktivnost smanjuje rizik padova u starijoj dobi i pomaže oporavku narušene funkcionalne sposobnosti (25). Ranija istraživanja pokazala su i da doživljaj boli može značajno utjecati na funkcionalni oporavak. Tako su Williams i sur. (19) utvrdili visoku povezanost intenziteta boli s oporavkom u domeni fizičkog i socijalnog funkcioniranja (osobe s višim intenzitetom boli slabije su se oporavljale), čak i uz kontrolu funkcionalnog statusa prije ozljede.

U manjoj su mjeri u ranijim istraživanjima u ovome području zahvaćeni aspekti mentalnog zdravlja poput ranije postojeće ili postoperacijske anksioznosti i depresivnosti i njihove uloge u procesu oporavka nakon operacije prijeloma kuka (22,26,27). Očekivano, ta istraživanja pokazuju da narušeno mentalno zdravlje prije ili nakon operacije otežava postoperacijski funkcionalni oporavak.

Uloga različitih psihosocijalnih faktora, poput socijalne podrške ili osobnih resursa kao što je otpornost, u ranijim je istraživanjima bila uglavnom zanemarena pa ne znamo mnogo o njihovom utjecaju na funkcionalni oporavak nakon operacije prijeloma kuka. Novi nalazi ukazuju da bi uključivanje psihosocijalnih čimbenika u model rehabilitacijske skrbi za pacijente nakon prijeloma kuka moglo biti važno za poboljšanje ishoda oporavka, smanjenje smrtnosti i ekonomskog opterećenja te osiguravanje poboljšanja kvalitete života nakon prijeloma u ovoj rastućoj populaciji pojedinaca (28-30). Primjerice, ot-

socioeconomic status, generally better health, preserved cognitive functions, and living with a spouse, experience a faster recovery following a hip fracture, including individuals with a better functional status before the injury (15-19). At the same time, previous functional status has proved to be one of the strongest predictors of postoperative functional capacity or daily life activity recovery (20-23).

Studies have certainly confirmed the importance of physical activity for the preservation of functional capacity and prevention of falls in older age. Continuous engagement in physical activity is considered to be one of the best methods for preserving functional capacity, and preventing and mitigating changes and diseases that occur with old age (24). Physical activity reduces the risk of falls in older age and helps in the recovery of impaired functional capacity (25). Earlier studies have also shown that the sensation of pain can have a significant impact on functional recovery. In that sense, Williams et al. (19) observed a high correlation between pain intensity and recovery within the scope of physical and social functioning (individuals with higher pain intensity were slower to recover), even if functional status was controlled before the injury.

Mental health aspects such as pre-existing or postoperative anxiety and depression, and their role in the recovery process after hip fracture surgery, were covered to a lesser extent in the earlier studies on this topic (22, 26, 27). Expectedly, these studies indicate that impaired mental health before or after surgery makes the postoperative functional recovery more difficult.

The role of various psychosocial factors, such as social support or personal resources like resilience, was mostly neglected in previous studies, therefore we do not have much knowledge with regard to their influence on postoperative functional recovery after hip fracture surgery. New findings indicate that the inclusion of psychosocial factors into the rehabilitation care model for patients following a hip fracture could be significant for improving the recovery outcomes,

pornost (engl. *resilience*) bi mogla imati značajnu ulogu u ovom kontekstu. Ona se odnosi na sposobnost efikasnog suočavanja s potencijalno stresnim događajima i situacijama (31) odnosno mogućnost osobe da izdrži i/ili se lako i brzo oporavi od teških situacija, nesreće ili bolesti (32) uz zadržavanje normalnog fiziološkog i psihološkog funkcioniranja (33) u mjeri u kojoj je to moguće. U takve stresne događaje zasigurno spadaju prijelom i operacija kuka pa bi izražena osobina otpornosti mogla olakšati nošenje s ovim stresnim događajima te postoperacijski oporavak.

Sve je više nalaza da i socijalni čimbenici poput ranije socijalne podrške ili podrške obitelji, prijatelja i medicinskog osoblja nakon operacije imaju značajnu ulogu u oporavku (29,30,34,35). Međutim, ti se čimbenici obično ne razmatraju, ne procjenjuju ili im se ne pridaje veća važnost u programima rehabilitacije prijeloma kuka (28,36,37).

Ranija istraživanja zahvaćala su manji broj uglavnom tjelesnih i funkcionalnih determinanti oporavka, dok su psihosocijalni čimbenici većinom bili zanemareni. Danas su stručnjaci u ovom području (npr. Kristensen, 2011) suglasni s mišljenjem da je oporavak poslije operacije prijeloma kuka determiniran većim brojem čimbenika, a ne samo jednim ili dvama pojedinačnim faktorima.

Glavni cilj provedenog istraživanja bio je utvrditi najvažnije odrednice uspješnosti funkcionalnog oporavka neposredno nakon operacije prijeloma kuka starijih osoba, odnosno ispitati i usporediti prediktivne doprinose čimbenika iz triju različitih skupina:

a) sociodemografskih (spol, dob, obrazovanje, bračni status, veličina kućanstva/način života),
b) zdravstvenih i funkcionalnih (ranija razina tjelesne aktivnosti, jačina boli, raniji funkcionalni status, kronične bolesti) i
c) psihosocijalnih (mentalno zdravlje, otpornost i socijalna podrška)

reducing mortality and economic burden, as well as improving the quality of life after the fracture in this growing population of individuals (28-30). For example, resilience could play a significant role in this context. It refers to the ability to efficiently cope with the potentially stressful events and situations (31), that is, the individual's ability to endure and/or easily and quickly recover from difficult situations, accidents, or diseases (32), all the while maintaining normal physiological and psychological functioning (33) to the extent possible. Such stressful events surely include hip fracture and surgery, therefore pronounced resilience could facilitate an individual's ability to cope with these stressful events and their postoperative recovery.

Increasing evidence suggests that social factors such as previous social or family support, or support provided by friends and medical personnel following a surgery play a significant role during recovery (29, 30, 34, 35). However, these factors are usually not considered, assessed or given higher priority in hip fracture rehabilitation programs (28, 36, 37).

Earlier studies included only a smaller number of mainly physical and functional determinants of recovery, while the psychosocial factors were mostly neglected. Nowadays, the experts in this field (e.g. Kristensen, 2011) agree that postoperative recovery after hip fracture surgery is determined by a larger number of factors, rather than only one or two individual factors.

The main aim of the conducted study was to identify the most important determinants of successful postoperative functional recovery immediately after hip fracture surgery in the elderly, i.e. to examine and compare the predictive contributions of factors from three different groups:

a) sociodemographic (gender, age, education, marital status, household size/lifestyle),
b) health and functional (previous physical activity level, pain intensity, previous functional status, chronic diseases), and
c) psychosocial (mental health, resilience and social support),

uspješnosti funkcionalnog oporavka starijih osoba neposredno nakon operacije kuka, tj. na dan izlaska iz bolnice.

Na temelju rezultata ranijih istraživanja i teorijskih razmatranja u ovome području pretpostavljeno je da će čimbenici iz svih triju skupina (sociodemografski, zdravstveni i funkcionalni te psihosocijalni) dati značajan doprinos postoperacijskom funkcionalnom statusu kao pokazatelju postoperacijskog oporavka.

METODA

Sudionici

U istraživanju je sudjelovalo 150 sudionika, u dobi od 65 do 99 godina (*M* = 81,63, *SD* = 8,11), hospitaliziranih zbog operacije prijeloma kuka. Korišten je neprobabilistički kvotni uzorak jer se istraživanjem namjeravalo zahvatiti oko 70 % ženskih i 30 % muških pacijenata Odjela traumatologije i ortopedije Opće bolnice Zadar, što odgovara godišnjem omjeru ženskih i muških pacijenata s prijelomom kuka. Kriteriji uključivanja sudionika bili su minimalna dob od 65 godina i hospitalizacija zbog prijeloma i operacije kuka. U uzorku je na kraju bilo 35 muškaraca (23,3 % uzorka) i 115 žena (76,7 %). U istraživanju nisu sudjelovale osobe s dijagnozom demencije i osobe koje su i prije pada bile nepokretne. Većina sudionika živjela je u bračnoj zajednici (N=93; 62 %) ili su bili udovci/udovice (N=46; 30,7 %). Samaca ili nikad vjenčanih bilo je sedmero (4,7 %), a razvedenih četvero (2,6 %). Niti jedan sudionik nije živio u nevjenčanoj zajednici. Većina sudionika je živjela samo s bračnim partnerom (N=65; 43,3 %). Osamnaest sudionika je navelo da žive sami (12 %). S partnerom i djecom živjelo je 27 (18 %), a samo s djecom (s unucima ili bez njih) 19 (12,7 %). Neki drugi oblik suživota (npr. s prijateljem ili drugim rođacima) naveo je 21 sudionik (14 %). S obzirom na stupanj obrazovanja, većina sudionika završila je srednju

for a successful functional recovery in the elderly immediately after hip surgery, i.e. on the day of hospital discharge.

Based on the results of previous studies and theoretical considerations in this field, the assumption was that the factors pertaining to all three groups (sociodemographic, health and functional, and psychosocial) would significantly contribute to the postoperative functional status as an indicator of postoperative recovery.

METHOD

Participants

The study involved 150 participants between 65 and 99 years of age (*M* = 81.63, *SD* = 8.11), hospitalized for hip fracture surgery. Nonprobability quota sampling was used since the aim of the study was to include approx. 70% of female and 30% of male patients admitted to the Department of Traumatology and Orthopedics at the Zadar General Hospital, which corresponds to the annual ratio of female and male patients with hip fracture. Participant inclusion criteria included a minimum age of 65 years and hospitalization due to hip fracture and surgery. The sample ultimately included 35 men (23.3% of the sample) and 115 women (76.7%). The study did not involve individuals with a diagnosis of dementia or those who were immobile before the fall. The majority of the participants were married (N=93; 62%) or widowed (N=46; 30.7%). Seven of the participants were single or never married (4.7%), while four were divorced (2.6%). None of the participants were living in a consensual union. The majority of the participants reported living alone with their spouses (N=65; 43.3 %). Eighteen participants reported living alone (12%). A total of 27 participants (18%) reported living with their partners and children, while 19 (12.7%) lived only with their children (with or without grandchildren). Some other form of cohabitation (e.g. living with a friend or other relatives) was reported by 21 participants (14%). With regard to the level

školu kao najviši stupanj obrazovanja (N=50; 33,3 %). 11 (7,33 %) završilo je nekoliko razreda osnovne škole, dok je 41 osoba (27,33 %) završila osmogodišnju osnovnu školu. Višu školu je završilo 30 sudionika (20 %), a visoku njih 18 (12 %). Velika većina ispitanih osoba je imala djecu (N=142; 94,7 %) pri čemu se kod njih broj djece kretao od 1 do 5, a većina je imala dvoje djece (Mod=2). Šezdeset i sedam sudionika (44,7 %) imalo je dijagnozu FCF (*fractura colli femoris*), 83 (55,3 %) dijagnozu FPF (*fractura pertrochanterica femoris*). Deset (7%) sudionika je prošlo operaciju TEP (totalna endoproteza), 57 (38 %) operaciju PEP (parcijalna endoproteza), a 83 (55 %) operaciju OS (osteosinteza).

Instrumenti

1. Upitnik općih sociodemografskih podataka koji sadrži pitanja koja se odnose na spol, dob, razinu obrazovanja, bračni status i veličinu kućanstva, tj. osobe s kojima pojedinac živi u istom kućanstvu. U prvom dijelu upitnika prikupljeni su i podatci koji se odnose na objektivni zdravstveni status pacijenta (broj i vrsta kroničnih bolesti), a evidentiran je i podatak o težini ozljede/dijagnozi i, naknadno, o vrsti operacije koju je osoba prošla.
2. Barthelovim indeksom funkcionalne sposobnosti (38) procijenjen je funkcionalni status prije i nakon operacije. Barthelov indeks ispituje sposobnost izvođenja 11 svakodnevnih aktivnosti: hranjenje, kupanje, osobna higijena, oblačenje, funkcioniranje probavnog trakta, funkcioniranje urinarnog trakta, upotreba WC-a, pomicanje s kreveta na stolac i obrnuto, pokretljivost i savladavanje stepenica. Pomoću odgovarajuće brojčane ljestvice, za svaku je aktivnost procijenjena sposobnost pacijenta da ju samostalno izvede. Viši ukupni rezultat označava veću samostalnost u izvođenju svakodnevnih aktivnosti i radnji. Barthelov indeks često se koristi za praćenje funkci-

of education, the majority of the participants reported completing high school as the highest level of education (N=50; 33.3%). Another 11 participants (7.33%) reported completing several grades of elementary school, while 41 participants (27.33%) completed the eight-year elementary school program. A total of 30 participants (20%) had higher education, while 18 (12%) had a university degree. The vast majority of the participants had children (N=142; 94.7%), whereby the number of children varied between 1 and 5, and most had two children (Mod=2). Sixty-seven participants (44.7%) were diagnosed with a femoral neck fracture (FCF - *fractura colli femoris*), and 83 (55.3%) with a pertrochanteric fracture of the femur (FPF - *fractura pertrochanterica femoris*). Ten participants (7%) underwent total hip replacement (THR), 57 (38%) underwent partial hip replacement (PHR), while 83 (55%) participants underwent osteosynthesis (OS).

Instruments

1. The general sociodemographic data questionnaire was used, containing questions in relation to the gender, age, education level, marital status and household size, i.e. persons living in the same household with the patient. Data relating to the objective health status of the patients (the number and types of chronic diseases) were also collected in the first part of the questionnaire, together with the data on the severity of the injury/diagnosis and, subsequently, the type of surgery they underwent.
2. The Barthel Index was used to assess functional capacity (38), examining the functional status before and after the surgery. The Barthel Index assesses the capacity to perform 11 daily activities: feeding, bathing, grooming, dressing, bowel control, bladder control, toilet use, transfers from the bed to chair and back, mobility on level surfaces and on stairs. Using the appropriate numerical scale, the patients' capacity to independently perform each activity is assessed. A higher

onalnog oporavka u kontekstu bolničke rehabilitacije, medicinske i kućne njege i sl.

3. Za procjenu ranije razine fizičke aktivnosti korištena su pitanja osmišljena za potrebe ovoga istraživanja. Ona ispituju prosječnu količinu vremena (sati, odnosno minuta u tjednu) koje je osoba provodila u tjelesnim aktivnostima visokog i umjerenog intenziteta, te vrijeme koje je provodila hodajući tijekom jednog tjedna, u razdoblju koje je prethodilo ozljedi. Slična pitanja korištena su i u ranijim istraživanjima tjelesne aktivnosti u starijih osoba. Pritom se mogu zasebno koristiti rezultati za svaku razinu aktivnosti (naporna, umjerena aktivnost i hodanje). Također bi bilo moguće izračunati ukupni rezultat koji bi se odnosio na ukupnu razinu tjelesne aktivnosti na način da se ponderira svaka razina aktivnosti prije njihova zbrajanja. U analizama u okviru ovoga rada korištene su zasebne procjene za svaku od tri razine tjelesne aktivnosti. Rezultati su izraženi kao broj sati tjedno proveden u pojedinim tjelesnim aktivnostima različitog intenziteta
4. Jačina fizičke boli ispitana je jednim pitanjem iz Upitnika zdravstvenog statusa SF-36 (39,40). Njime se na ljestvici od 1 (nikakva) do 6 (vrlo teška) procjenjuje jačina tjelesnih bolova u protekla četiri tjedna.
5. Mentalno zdravlje ispitano je pomoću podljestvice mentalnog zdravlja (MH, *mental health*) iz Upitnika zdravstvenog statusa SF-36 (39,40). Ljestvica sadrži pet pitanja koja ispituju doživljaje anksioznosti, depresivnosti i stresa kao glavne indikatore mentalnog zdravlja. Pojedini odgovori na svaku od tvrdnji različito se boduju prema unaprijed utvrđenim empirijskim normama, a s obzirom na dijagnostičku vrijednost određenog odgovora ispitanika. Ukupan rezultat na ljestvici izražava se kao standardizirana vrijednost u rasponu od 0 do 100 pri čemu viši rezultat označava bolje mentalno zdravlje.

overall score implies greater independence in the performance of daily activities and actions. The Barthel Index is often used for the purpose of monitoring functional recovery within the context of hospital rehabilitation, medical and in-house care, etc.

3. Questions designed for the purposes of this study were used for the assessment of previous physical activity level. They assess the average amount of time (hours, i.e. minutes in a week) that the individual spent engaging in physical activities of high and moderate intensity, and the time spent walking in the course of a week, in the period preceding the injury. Similar questions were used in previous studies examining the physical activities of elderly individuals. In doing so, the results for each level of activity (strenuous, moderate activity and walking) can be used separately. It would also be possible to calculate the overall result relating to the total level of physical activity by weighting each level of activity before adding them together. Separate assessments for each of the three levels of physical activity were used in the analyses conducted for the purposes of this paper. The results are expressed as the number of hours per week spent engaging in individual physical activities of different intensity.
4. The intensity of physical pain was assessed using one question from the Short Form Health Survey (SF-36) (39, 40). It is used to estimate the intensity of physical pain in the past four weeks using a scale from 1 (none) to 6 (very severe).
5. Mental health was assessed using the Short-Form Health Survey (SF-36) mental health subscale (MH) (39, 40). The scale consists of five questions that evaluate the perception of anxiety, depression and stress as the main indicators of mental health. Answers to each individual statement are scored differently according to predetermined empirical standards, taking into account the diagnostic values of specific answers provided by the respondents. The total score on the scale is

6. Konstrukt otpornosti ispitan je Kratkom ljestvicom otpornosti (41), odnosno njezinom adaptiranom hrvatskom verzijom (42). Ljestvica sadrži šest čestica kojima se ispituje osobni resurs otpornosti definiran kao mogućnost osobe da izdrži i/ili se lako i brzo oporavi od stresne situacije, nesreće ili bolesti. Ispitanik označava svoje slaganje sa svakom tvrdnjom na ljestvici od pet stupnjeva, od 1 (uopće se ne slažem) do 5 (u potpunosti se slažem). Ukupan rezultat na ljestvici se, uz prethodno obrnuto bodovanje triju čestica negativnog smjera, izračunava kao prosječan rezultat na svim česticama pri čemu viši rezultat ukazuje na izraženiju otpornost.
7. Socijalna podrška je ispitana Ljestvicom socijalne podrške (43). Riječ je o kratkoj ljestvici koja pomoću tri pitanja ispituje učestalost triju vrsta socijalne podrške: druženje, emocionalnu i instrumentalnu podršku. Ispitanik pomoću ljestvice od tri stupnja (1 = nemam nikoga, 2 = imam, povremeno i 3 = imam, gotovo uvijek) odgovara na tri tvrdnje koje procjenjuju tri vrste podrške („Imate li nekoga tko Vam obično pravi društvo?“, „Imate li nekoga s kim razgovarate kad imate problema?“ i „Imate li nekoga tko Vam pomaže u raznim sitnim poslovima?“). Ukupan rezultat računa se kao zbroj procjena na tri čestice te se kreće od 3 do 9 ili kao zbroj procjena podijeljen brojem čestica u kojem se slučaju kreće u rasponu od 1 do 3. Pritom viši rezultat označava veću socijalnu podršku.

Postupak

Provedeno je kratko longitudinalno istraživanje s dvije točke mjerenja, uz individualnu primjenu upitnika kojim su zahvaćeni relevantni konstrukti te procjena funkcionalnog statusa. Podatci su prikupljani od 1. siječnja 2023. do 30. lipnja 2024. godine. Prikupljala ih je prva autorica ovoga rada koja je ujedno i glavna se-

expressed as a standardized value ranging from 0 to 100, with a higher score indicating better mental health.

6. The resilience construct was assessed using the Brief Resilience Scale (41), i.e. its adapted version in Croatian (42). The scale consists of six items that evaluate the personal resilience resource defined as the individual's ability to endure and/or easily and quickly recover from a stressful situation, accident or illness. The respondent marks their agreement with each statement using a five-point scale, ranging from 1 (I totally disagree) to 5 (I totally agree). The total score on the scale, with previous reverse scoring for the three negative direction items, is calculated as the average score in all items, whereby a higher score indicates higher resilience.
7. Social support was assessed using the Social Support Scale (43). This is a short scale containing three questions used to examine the availability of three types of social support: companionship, emotional, and instrumental support. Using a three-degree scale (1 = I have no one, 2 = I have, occasionally, and 3 = I have, almost always), the respondents provide answers to three statements assessing the three types of support ("Do you have anyone who usually keeps you company?", "Do you have anyone to talk to when you have a problem?", and "Do you have anyone to help you in doing various little chores?"). The total result is calculated as the sum of the answers provided for the three items and ranges from 3 to 9, or as the sum of answers divided by the number of items, in which case it ranges from 1 to 3. A higher score, thereby, indicates higher social support.

Procedure

A short longitudinal study with two measurement points was conducted, along with an individual application of the questionnaire encompassing the relevant constructs, and a functional status assessment. The data were collected in the period

stra Odjela za traumatologiju i ortopediju Opće bolnice Zadar. Podatke je prikupila usmenom primjenom upitnika koji je obuhvatio sve ranije opisane relevantne instrumente.

Prvo mjerenje provedeno je neposredno (unutar nekoliko sati) nakon prijma na odjel, nakon inicijalnog razgovora s bolesnikom s ciljem lakše prilagodbe na bolničke uvjete i predstojeću operaciju. Sudionici su prije početka istraživanja upoznati sa svrhom i načinom provođenja istraživanja, dobrovoljnošću sudjelovanja i pravom na odustajanje u bilo kojem trenutku nakon čega je zatražen njihov obaviješteni pristanak na sudjelovanje u istraživanju. U prvoj točki mjerenja usmeno je primijenjen upitnik s mjernim instrumentima kojima su zahvaćeni potencijalni prediktori uspješnosti postoperacijskog funkcionalnog oporavka, tj. sociodemografske varijable, postojeće kronične bolesti, funkcionalni status prije operacije, ranija razina tjelesne aktivnosti, jačina boli, mentalno zdravlje, osobina otpornosti i percipirana socijalna podrška. Drugo mjerenje je provedeno osmi dan nakon što je osoba operirana, tj. na dan otpusta iz bolnice, kada su ponovnom primjenom Barthelovog indeksa prikupljeni podatci o ishodnoj varijabli, tj. funkcionalnom statusu nakon operacije. Evidentiran je i podatak o dijagnozi i o vrsti provedenog kirurškog zahvata. Provedbu istraživanja odobrilo je Povjerenstvo za etička pitanja Opće bolnice Zadar.

Sudionici su bili izjednačeni s obzirom na broj dana hospitalizacije i postoperacijski medicinski i rehabilitacijski tretman tako da ove varijable u planiranom istraživanju nisu razmatrane kao potencijalni prediktori uspješnosti oporavka. Svi su pacijenti imali sličan postoperacijski tretman, dobivali su istu analgeziju (nesteroidne antireumatike, NSAR); kirurška rana je zarasla *per primam*. Fizioterapeuti su radili svaki dan u 2 navrata po 25 minuta sa svakim pacijentom u svrhu rehabilitacije, tako da su svi imali slične uvjete za što bolju funkcionalnu rehabilitaciju.

between 1 January 2023 and 30 June 2024. They were collected by the first author of this study, who is also the head nurse of the Department of Traumatology and Orthopedics at the Zadar General Hospital. The data were collected by oral application of the questionnaire which included all of the aforementioned relevant instruments.

The first assessment was performed immediately (within several hours) after admission to the Department, and following an initial conversation with the patient conducted in order to facilitate their adjustment to hospital conditions and the upcoming surgery. Before the start of the study, the participants were familiarized with the purpose and method of the study, they were informed that their participation was voluntary and that they were entitled to withdraw from the study at any moment, after which an informed consent was requested from the patients for their participation in the study. At the first point of assessment, the questionnaire containing the measuring instruments was orally applied, which encompassed the potential predictors of successful postoperative functional recovery, i.e. the sociodemographic variables, existing chronic diseases, functional status before surgery, previous level of physical activity, pain intensity, mental health, resilience and perceived social support. The second assessment was conducted on the eighth day post-surgery, i.e. on the day of hospital discharge, when the Barthel Index was used again in order to collect data on the outcome variable, i.e. functional status after the surgery. Data on the diagnosis and the type of surgical procedure performed were collected as well. The study was approved by the Ethics Committee of the Zadar General Hospital.

The participants spent an equal number of days in the hospital and had the same postoperative medical and rehabilitation treatment, therefore these variables were not considered as potential predictors of successful recovery in the planned study. All patients had similar postoperative treatment, the same analgesia protocol (nonsteroidal antirheumatics, NSAR), and their surgical wound healed *per primam*. For rehabilitation

REZULTATI

Osnovni deskriptivni pokazatelji korištenih instrumenata

Prije odgovora na glavno istraživačko pitanje izračunati su osnovni deskriptivni parametri ispitanih varijabli koji su prikazani u tablici 1.

Kolmogorov-Smirnovljev test normalnosti distribucije pokazao je da distribucije rezultata na svim ljestvicama značajno odstupaju od normalne. Međutim, indeksi asimetričnosti i spljoštenosti nemaju ekstremne vrijednosti što dopušta korištenje parametrijske statistike (44). Koeficijenti unutarnje konzistencije Cronbach alpha korištenih validiranih mjernih instrumenata s većim brojem čestica (Barthelovog indeksa u obje primjene, ljestvice mentalnog zdravlja, ljestvice otpornosti i ljestvice socijalne podrške) kreću se oko vrijednosti od

purposes, physical therapists worked with each patient two times every day, each treatment lasting 25 minutes, therefore all of them had similar conditions for the best possible functional rehabilitation.

RESULTS

Basic descriptive indicators of instruments used

The basic descriptive parameters of the examined variables were calculated before answering the main research question, as presented in Table 1.

The results of the Kolmogorov-Smirnov test for normality of distribution showed that the result distributions on all scales significantly deviated from normal. However, the skewness and kurtosis indices did not indicate extreme values, which

TABLICA 1. Osnovni deskriptivni podatci ispitanih varijabli (N=150)
TABLE 1. Basic descriptive data of the variables examined (N=150)

Varijable / Variables	Aritmetička sredina / Arithmetic mean (M)	Raspon / Range	Standardna devijacija / Standard deviation (SD)	Asimetričnost / Skewness (SKW)	Spljoštenost / Kurtosis (KTS)	Kolmogorov-Smirnovljev test / Kolmogorov–Smirnov test (K-S d)	Cronbach alpha / Cronbach alpha
Barthelov indeks u predoperacijskoj primjeni / Preoperative Barthel Index	94,16	43,00-105,00	12,64	-1,41	1,70	0,22**	0,92
Barthelov indeks u postooperacijskoj primjeni / Postoperative Barthel Index	53,80	18,00-81,00	17,28	-0,22	-1,29	0,17**	0,89
Broj bolesti / Number of diseases	1,03	0,00-3,00	0,83	0,29	-0,73	0,22**	---
Naporna tjelesna aktivnost / Strenuous physical activity	4,44	0,00-14,00	3,05	0,71	-0,76	0,30**	---
Umjerena tjelesna aktivnost / Moderate physical activity	11,62	0,00-24,00	6,32	-0,12	-0,74	0,21**	---
Šetnja / Strolls	12,37	4,00-21,00	4,56	0,30	-0,59	0,25**	---
Procjena boli / Pain assessment	3,50	1,00-5,00	0,81	-0,78	0,26	0,33**	---
Mentalno zdravlje / Mental health	55,86	28,00-72,00	10,83	-0,59	0,06	0,16**	0,91
Otpornost / Resilience	2,73	1,00-4,33	0,96	-0,05	-1,18	0,17**	0,97
Socijalna podrška / Social support	2,42	1,00-3,00	0,54	-0,20	-1,08	0,31**	0,98

*p < 0,05, **p < 0,01

0,90 ili prelaze tu vrijednost, što ukazuje na visoku pouzdanost tipa unutarnje konzistencije korištenih instrumenata.

Iz tablice 1 je nadalje vidljivo da su prosječni rezultati na Barthelovom indeksu u prvoj primjeni pomaknuti prema višim vrijednostima te ukazuju na u prosjeku dobar predoperacijski funkcionalni status ispitanih osoba, odnosno na njihovu prosječno malu ovisnost o tuđoj pomoći u obavljanju procijenjenih aktivnosti. Ukupni rezultati na Barthelovom indeksu u drugoj primjeni, nakon operacije, značajno su niži. Kreću se u rasponu od 18 do 81 s prosječnim rezultatom od 53,80 koji ukazuje na težu ovisnost o tuđoj pomoći u ovom razdoblju neposredno nakon operacije. T-test za zavisne uzorke potvrdio je da je razlika u ukupnim rezultatima na Barthelovom indeksu u dvije primjene statistički značajna ($t(149) = 44,89$, $p < 0,00001$).

Što se tiče prediktorskih varijabli zahvaćenih ovim istraživanjem koje se odnose na zdravlje i zdravstvene navike pokazalo se da su sudionici ovoga istraživanja od ponuđenih 8 kroničnih bolesti i dijagnoza najčešćih u starijoj populaciji (artritis, povišeni krvni tlak, bolesti srca i krvnih žila, dijabetes, rak, osteoporoza, moždani udar i plućne bolesti), uz mogućnost navođenja dodatnih dijagnoza, navodili da imaju od nijedne do maksimalno tri bolesti. Prosječan broj bolesti (M) je iznosio jedan, a najveći broj sudionika je naveo da ima jednu od ponuđenih bolesti (Mod=1). Iznenađuje relativno velik broj sudionika - 44 (29,3 % uzorka), koji je naveo da ne boluje ni od jedne od ponuđenih bolesti.

U tablici 2 su navedene frekvencije bolesti od kojih su sudionici naveli da boluju.

Iz tablice 2 je vidljivo da su ispitane starije osobe najčešće navodile da boluju od bolesti srca i krvnih žila (32 % uzorka) i hipertenzije (30 % uzorka).

U pogledu tjelesne aktivnosti sudionici su naveli da su u razdoblju koje je neposredno pret-

allows for the use of parametric statistics (44). The Cronbach Alpha internal consistency coefficients of used validated measuring instruments with a higher number of items (Barthel Index in both applications, mental health scale, resilience scale and social support scale) were within the approx. value of 0.90 or exceeded the value, which indicates high reliability of the internal consistency type of the instruments used.

Table 1 further shows that the average Barthel Index scores in the first application shifted toward the higher values, indicating generally good preoperative functional status of the participants, i.e. their general low dependence on the help of others in the performance of the assessed activities. The total Barthel Index scores in the second application, after surgery, are significantly lower. They range between 18 and 81, with the average score of 53.80, indicating greater reliance on the help of others in the period immediately after surgery. The t-test for dependent samples confirmed the statistically significant difference between the final scores of the Barthel Index in the two applications ($t(149) = 44.89$, $p < 0.00001$).

Regarding the predictor variables included in this study which refer to health and health habits, it was observed that among the presented eight chronic diseases and diagnoses most common in the elderly population (arthritis, high blood pressure, heart and blood vessel diseases, diabetes, cancer, osteoporosis, stroke and lung diseases), with the possibility of naming additional diagnoses, the study participants generally reported suffering from none and up to three diseases. The average number of diseases (M) was one, and most of the participants reported suffering from one of the presented diseases (Mod=1). It was surprising that a relatively large number of participants - 44 (29.3% of the sample) reported not suffering from any of the presented diseases.

The aforementioned frequencies of the diseases reported by the participants are presented in Table 2.

It is evident from Table 2 that the surveyed elderly individuals most commonly reported suffering

TABLICA 2. Frekvencija kroničnih bolesti u ispitanom uzorku (N=150)
TABLE 2. Frequency of chronic diseases in the examined sample (N=150)

Vrsta bolesti / Type of disease	f (%)
Bolesti srca i krvnih žila / Heart and blood vessel diseases	48 (32)
Hipertenzija / Hypertension	45 (30)
Osteoporoza / Osteoporosis	23 (15,3)
Dijabetes / Diabetes	14 (9,3)
Artritis / Arthritis	11 (7,3)
Plućne bolesti / Lung diseases	5 (3,3)
Karcinom / Cancer	4 (2,7)
Neka druga bolest: / Other diseases:	
Hipotireoza / Hypothyroidism	3 (2)
Hipertireoza / Hyperthyroidism	1 (0,6)
Dermatitis / Dermatitis	1 (0,6)

Napomena: f - frekvencija navođenja određene bolesti ili broj sudionika koji je naveo da boluje od određene bolesti; % - postotak sudionika koji je naveo da boluje od određene bolesti
/ Note: f - frequency of reporting certain disease or number of participants who reported suffering from a certain disease; % - percentage of participants who reported suffering from a certain disease

hodilo ozljedi provodili u prosjeku 4,44 sati/tjedan u napornijoj tjelesnoj aktivnosti (npr. trčanje, plivanje, brza vožnja bicikla, dizanje teških predmeta, kopanje). U umjerenoj tjelesnoj aktivnosti (npr. lagani ples, vježbanje na prostirci, umjereni rad u vrtu, lakši kućanski poslovi kao što su usisavanje ili nošenje lakog tereta) u istom razdoblju su provodili 11,62 sati tjedno, dok su šetajući ili hodajući u razdoblju koje je neposredno prethodilo ozljedi provodili u prosjeku 12,37 sati/tjedan (slika 1). Očekivano, najviše vremena provodili su u šetnji i umjerenoj tjelesnoj aktivnosti.

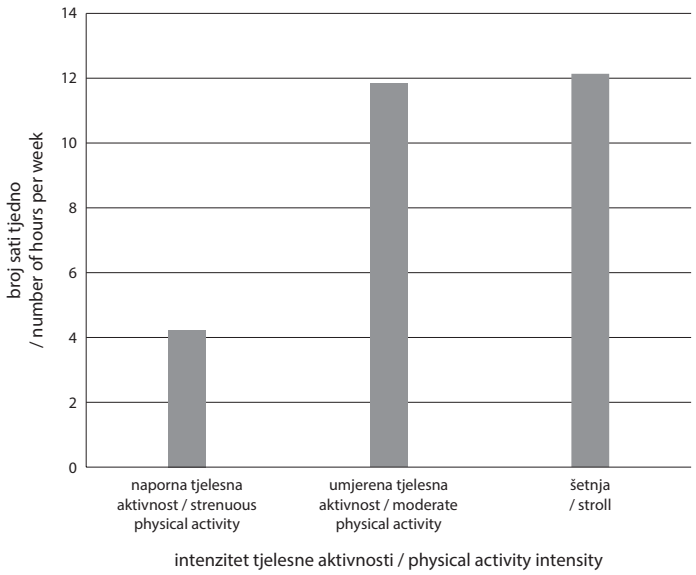
Prosječna procjena tjelesnih bolova u protekla četiri tjedna na ljestvici od 1 (nikakvi) do 6 (vrlo teški) iznosila je 3,5, što odgovara blagim do umjerenim bolovima. Najčešća vrijednost (Mod) iznosila je pak 4, što znači da je najveći broj sudionika istraživanja označio da je u protekla četiri tjedna doživljavao umjerene bolove (slika 2). Niti jedan sudionik nije naveo da je doživljavao vrlo teške bolove što bi odgovaralo maksimalnoj procjeni.

Što se tiče ispitanih psihosocijalnih čimbenika (mentalno zdravlje, otpornost i socijalna podrška), prosječna vrijednost ukupnih rezultata

from heart and blood vessel diseases (32 % of the sample) and hypertension (30% of the sample).

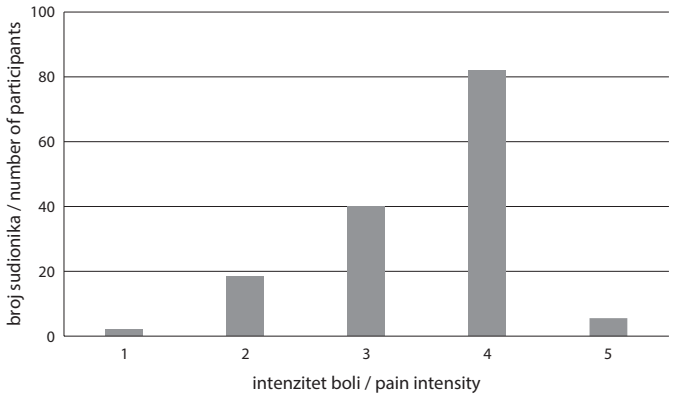
As regards physical activity, the participants reported spending 4.44 hours/week on average engaging in more strenuous physical activities in the period immediately preceding the injury (e.g. running, swimming, fast cycling, lifting heavy objects, digging). They spent 11.62 hours/week engaging in moderate physical activities (e.g. slow dancing, exercising on a mat, moderate gardening, easier household chores such as vacuuming or lifting light objects) in the same period, while they spent an average of 12.37 hours/week strolling or walking in the period immediately preceding the injury (Figure 1). Expectedly, they spent the most time strolling or engaging in moderate physical activity.

The reported average assessment of physical pain in the past four weeks on a scale from 1 (none) to 6 (severe) amounted to 3.5, which corresponds to mild to moderate pain. The most common value (Mod) amounted to 4, meaning that the majority of the study participants experienced moderate pain in the past four weeks (Figure 2). None of the participants reported experiencing severe pain, which would correspond to the maximum assessment.



SLIKA 1. Prosječan broj sati/tjedan provedenih u tjelesnim aktivnostima različitog intenziteta u razdoblju koje je prethodilo ozljedi (N=150)

FIGURE 1. Average hours/week spent engaging in physical activities of various intensity in the period preceding the injury (N=150)



SLIKA 2. Procjena intenziteta boli u protekla 4 tjedna (N= 150)

FIGURE 2. Pain intensity assessment in the past four weeks (N=150).

na podljestvici mentalnog zdravlja niža je u odnosu na hrvatske nacionalne norme za populaciju osoba starijih od 65 godina (40). Prosječni rezultat na ljestvici otpornosti blizu je teorijskom prosjeku na ljestvici, dok su rezultati na ljestvici socijalne podrške blago pomaknuti prema višim vrijednostima.

Svi prethodno opisani deskriptivni parametri na razini ukupnih rezultata na pojedinim mjerama ukazuju da je riječ o uzorku osoba relativno dobroga općeg zdravlja (ako izuzmemo dijagnozu zbog koje su operirani) i zadovolja-

With regard to the psychosocial factors examined (mental health, resilience and social support), the average total score on the mental health subscale is lower in comparison to the Croatian national norms for the population of individuals older than 65 (40). The average score on the resilience scale is close to the scale theoretical average, while the score on the social support scale is slightly in favor of the higher values.

All of the abovementioned descriptive parameters at the total score level per individual measure indicate that this is a sample of individuals

vajućeg mentalnog zdravlja, psihološke otpornosti i percipirane socijalne podrške.

Povezanosti među ispitanim varijablama

Prije odgovora na glavno istraživačko pitanje, izračunati su Pearsonovi koeficijenti korelacije između potencijalnih prediktorskih varijabli iz triju različitih skupina (sociodemografske, zdravstvene i funkcionalne te psihosocijalne) te rezultata na kriterijskoj varijabli, tj. Barthelovom indeksu primijenjenom nakon operacije. Rezultati korelacijskih analiza prikazani su u tablici 3.

Sve su ispitane varijable bile međusobno značajno i uglavnom umjereno visoko povezane. Povezanosti su bile očekivanog smjera, odnosno sve su bile pozitivne osim koeficijenata povezanosti procjene boli, broja bolesti te dobi s ostalim ispitanim varijablama, koji su bili negativnog smjera. Među demografskim varijablama u

in relatively good general health (apart from the diagnosis for which they underwent surgery) and with satisfactory levels of mental health, psychological resilience and perceived social support.

Association between the variables examined

The Pearson correlation coefficients between potential predictor variables from the three different groups (sociodemographic, health and functional, and psychosocial) and the results on the criterion variable, i.e. Barthel Index applied after surgery, were calculated before answering the main research question. The results of correlation analyses are presented in Table 3.

All of the examined variables were significantly and generally moderately highly correlated. The correlations were expected, i.e. all were positive except for the correlation coefficients of pain assessment, number of diseases and age with the other examined variables, which were nega-

TABLICA 3. Pearsonovi koeficijenti korelacije između ispitanih prediktorskih (dob, zdravstvene i funkcionalne te psihosocijalne varijable) i kriterijskih varijabli (postoperacijski funkcionalni status)
TABLE 3. The Pearson correlation coefficients between the examined predictor (age, health and functional, and psychosocial variables) and criterion variables (postoperative functional status)

Varijable / Variables	Dob / Age	BI1	BI2	BB / ND	NTA / SPA	UTA / MPA	Š / S	PB / PA	BMI	SZ / SS	MZ / MH	OT / RE
Dob / Age	1,00											
Barthelov indeks u predoperativnoj primjeni / Preoperative Barthel Index (BI1)	-0,72*	1,00										
Barthelov indeks u postooperativnoj primjeni / Postoperative Barthel Index (BI2)	-0,74*	0,77*	1,00									
Broj bolesti (BB) / Number of diseases (ND)	0,55*	-0,28*	-0,36*	1,00								
Naporna tjelesna aktivnost (NTA) / Strenuous physical activity (SPA)	-0,77*	0,61*	0,73*	-0,40*	1,00							
Umjerena tjelesna aktivnost (UTA) / Moderate physical activity (MPA)	-0,73*	0,71*	0,66*	-0,37*	0,56*	1,00						
Šetnja (Š) / Walk (W)	-0,70*	0,63*	0,59*	-0,43	0,55**	0,81*	1,00					
Procjena boli (PB) / Pain assessment (PA)	0,62*	0,51	-0,58*	0,41*	-0,64*	-0,49*	-0,49*	1,00				
Mentalno zdravlje (MZ) / Mental health (MH)	-0,46*	0,51*	0,56*	-0,33*	0,45*	0,46*	0,36*	-0,56			1,00	
Otpornost (OT) / Resilience (RE)	-0,66*	0,63*	0,70*	-0,41*	0,61*	0.60*	0,54*	-0,57*			0,72*	1,00
Socijalna podrška (SP) / Social support (SS)	-0,62*	0,54*	0,61*	-0,30*	0,55*	0,54*	0,53*	-0,55			0,58*	0,67*

*p < 0,01

tablicu 3 je uključena jedino dob kao kontinuirana varijabla. Pokazalo se da je dob značajno negativno i većinom umjereno visoko povezana sa svim ispitanim varijablama, osim njezine pozitivne korelacije s brojem bolesti i doživljajem boli. To znači da je u ispitanom uzorku starijih osoba s višom dobi bio značajno povezan veći broj kroničnih bolesti, lošiji predoperacijski i postoperacijski funkcionalni status, manje vremena provedenog u tjelesnim aktivnostima različite razine napora, veća procjena boli te lošije mentalno zdravlje, manja psihološka otpornost i niža percipirana socijalna podrška.

Procjena boli kao intenzivnije bila je značajno povezana s višom dobi, lošijim funkcionalnim statusom u oba mjerenja, manjom uključenošću u različite razine tjelesne aktivnosti, lošijim mentalnim zdravljem, manjom psihološkom otpornošću te manjom percipiranom socijalnom podrškom. Funkcionalni status nakon operacije (BI2), tretiran kao kriterijska varijabla u regresijskim analizama u nastavku, značajno je i većinski umjereno visoko korelirao sa svim prediktorskim varijablama iz tablice 3, tj. s varijablama iz skupine zdravstvenih i funkcionalnih (boljim predoperativnim funkcionalnim statusom, manjim brojem kroničnih bolesti, višim različitim razinama tjelesne aktivnosti prije ozljede,s manjom procjenom jačine boli). Nadalje, postoperacijski funkcionalni status bio je značajno povezan i sa psihosocijalnim resursima, tj. s boljim mentalnim zdravljem, većom otpornošću u nošenju sa životnim izazovima i s većom percipiranom dostupnošću socijalne podrške.

Značajne korelacije između pojedinih ispitanih psihosocijalnih varijabli, tj. između mentalnog zdravlja, otpornosti i socijalne podrške, također su očekivane, jer je za pretpostaviti da među njima postoje obostrani međusobni utjecaji. Primjerice, otpornost i socijalna podrška vjerojatno doprinose boljem mentalnom zdravlju, ali i bolje mentalno zdravlje može ojačati psihološku otpornost i povećati mogućnost dobivanja socijalne podrške. Međutim, na osnovi provetive. Age as a continuous variable was the only demographic variable included in Table 3. It was observed that age has a significant negative and mostly moderately high correlation with all of the examined variables, except for its positive correlation with the number of diseases and the perception of pain. This means that, in the examined sample of elderly individuals, higher age was significantly correlated with a larger number of chronic diseases, worse preoperative and postoperative functional status, less time spent engaging in physical activities of various intensity, higher pain assessment and worse mental health, lower psychological resilience and lower perceived social support.

The assessment of pain as more intense was significantly correlated with higher age, worse functional status in both assessments, lower engagement in various levels of physical activity, worse mental health, lower psychological resilience and lower perceived social support. The postoperative functional status (BI2), treated as a criterion variable in regression analyses further in the text, had a significant and mostly moderately high correlation with all of the predictor variables in Table 3, i.e. with the health and functional variables (better preoperative functional status, fewer chronic diseases, higher various levels of physical activity before the injury, lower pain intensity assessment). Furthermore, the postoperative functional status was also significantly correlated with psychosocial resources, i.e. better mental health, higher resilience in coping with the challenges of life and better perceived availability of social support.

Significant correlations between individual examined psychosocial variables, i.e. between mental health, resilience, and social support were also expected, since it was presumable that reciprocal mutual influences existed between them. For example, resilience and social support likely contribute to better mental health, but better mental health can also strengthen psychological resilience and increase the possibility of receiving social support. However, based on the conducted correlation analyses, we can only make reliable

denih korelacijskih analiza možemo pouzdano zaključivati samo o povezanostima ali ne i o kauzalnim odnosima među ispitanim varijablama.

Prediktivni doprinos socidemografskih, zdravstvenih i funkcionalnih te psihosocijalnih varijabli postoperacijskom funkcionalnom statusu

Kako bi se odgovorilo na glavno istraživačko pitanje, a to je utvrditi koliki je relativni doprinos čimbenika iz triju različitih skupina: a) socidemografskih (spol, dob, obrazovanje, bračni status, veličina kućanstva / s kim žive), b) zdravstvenih i funkcionalnih (ranija razina tjelesne aktivnosti, jačina boli, raniji funkcionalni status, postojeće kronične bolesti) te c) psihosocijalnih (mentalno zdravlje, otpornost i socijalna podrška) uspješnosti funkcionalnog oporavka starijih osoba neposredno nakon operacije prijeloma kuka, tj. na dan otpusta iz bolnice, provedene su regresijske analize. Najprije je provedena standardna multipla regresijska analiza u kojoj su svi potencijalni prediktori zajedno uvedeni u regresijsku analizu kako bi se mogao usporediti relativni doprinos svakoga od potencijalnih prediktora objašnjenju varijance rezultata na Barthelovom testu primijenjenom nakon operacije (tablica 4).

Rezultati provedene regresijske analize, prikazani u tablici 4, pokazali su da među svim uvedenim prediktorima samo obrazovanje, predoperacijski funkcionalni status i broj sati proveden u napornijoj tjelesnoj aktivnosti u razdoblju neposredno prije ozljede značajno doprinose objašnjenju postoperacijskog funkcionalnog statusa. Najveći zasebni doprinos postoperacijskom funkcionalnom oporavku, odnosno najveći beta koeficijent, imao je rezultat na Barthelovom testu primijenjenom poslije prijma u bolnicu, tj. predoperacijski funkcionalni status. Na osnovi smjera i značajnosti utvrđenih regresijskih koeficijenata može

conclusions about the correlations, and not about the causal relationships between the variables examined.

Predictive contribution of sociodemographic, health and functional, and psychosocial variables to the postoperative functional status

In order to answer the main research question, which was to determine the extent of the relative contribution of the factors from three different groups: a) sociodemographic (gender, age, education, marital status, household size/who they live with), b) health and functional (previous level of physical activity, pain intensity, previous functional status, existing chronic diseases), and c) psychosocial (mental health, resilience and social support), for a successful functional recovery among the elderly immediately after hip fracture surgery, i.e. on the day of hospital discharge, regression analyses were conducted. A standard multiple regression analysis was carried out first, in which all potential predictors were introduced together in the regression analysis in order to compare the relative contribution of each of the potential predictors to explaining the variance of the results on Barthel's test applied after the surgery (Table 4).

The results of the conducted regression analysis presented in Table 4 show that among all of the introduced predictors, only education, preoperative functional status and number of hours spent engaging in more strenuous physical activity in the period immediately before the injury significantly contribute to the explanation of postoperative functional status. The biggest individual contribution to postoperative functional recovery, that is the highest beta coefficient, was seen in the results of the Barthel test applied after admission to the hospital, i.e. the preoperative functional status. Based on the direction and significance of determined regression coefficients, it can be concluded that a better preoperative func-

TABLICA 4. Rezultati standardne multiple regresijske analize sa sociodemografskim karakteristikama, značajkama zdravstvenog i funkcionalnog statusa te psihosocijalnim varijablama kao prediktorima postoperacijskog funkcionalnog statusa (N=150)
TABLE 4. Results of standard multiple regression analysis with sociodemographic characteristics, health and functional status features and psychosocial variables as predictors of postoperative functional status (N=150).

	Postoperacijski funkcionalni status (Barthelov indeks) / Postoperative functional status (Barthel Index)
Prediktori / Predictors	**ß**
Spol (1 – muškarci, 2 – žene) / Gender (1 – male, 2 – female)	-0,08
Dob / Age	-0,16
Obrazovanje (1 – nezavršena i završena OŠ, 2 – SŠ, 3 – viša i visoka škola) / Education (1 – incomplete and completed elementary school, 2 – high school, 3 – higher education and university degree)	-0,18*
Bračni status (1 – u braku, 2 – samci, razvedeni, udovci) / Marital status (1 – married, 2 – single, divorced, widowed)	-0,04
Veličina kućanstva/način života (1 – živi sami, 2 – živi s nekim) / Household size/lifestyle (1 – living alone, 2 – cohabiting)	-0,07
Funkcionalna sposobnost (Barthelov indeks) prije operacije / Functional capacity (Barthel Index) before surgery	0,34***
Broj bolesti / Number of diseases	0,02
Naporna tjelesna aktivnost / Strenuous physical activity	0,25**
Umjerena tjelesna aktivnost / Moderate physical activity	0,10
Šetnja / Strolls	-0,02
Procjena boli / Pain assessment	-0,00
Mentalno zdravlje / Mental health	0,08
Otpornost / Resilience	0,15
Socijalna podrška / Social support	0,08
R^2	0,754***
Korigirani R^2 / Corrected R^2	0,728***
F (14,135)	29,550***

*p < 0,05, **p < 0,01, ***p < 0,001
β – β-koeficijent / β – β-coefficient

se zaključiti da bolji predoperacijski funkcionalni status i veći broj sati proveden u napornijim tjelesnim aktivnostima u razdoblju koje je prethodilo ozljedi značajno doprinose boljem funkcionalnom oporavku nakon operacije prijeloma kuka. Međutim, rezultat koji pokazuje da viša razina obrazovanja doprinosi lošijem postoperacijskom funkcionalnom statusu je rezultat koji nije očekivan.

Sve su varijable uvedene u regresijsku analizu zajedno objasnile značajnih i visokih oko 73 % varijance rezultata na Barthelovom indeksu, kao pokazatelju postoperacijskog funkcionalnog oporavka, usprkos neznačajnim zasebnim doprinosima većine zahvaćenih prediktora

tional status and larger number of hours spent engaging in more strenuous physical activities in the period preceding the injury significantly contribute to a better functional recovery after hip fracture surgery. However, the results showing that higher levels of education contribute to a worse postoperative functional status were unexpected.

All of the variables introduced together into the regression analysis explain the significant and high result of approx. 73% of the result variance in the Barthel Index as an indicator of postoperative functional recovery, despite the insignificant individual contributions of most of the predictors included.

Kako bi se usporedio doprinos pojedinih skupina prediktora (a) sociodemografski, b) zdravstveni i funkcionalni te c) psihosocijalni) postoperacijskom funkcionalnom oporavku, u nastavku je provedena hijerarhijska regresijska analiza, rezultati koje su prikazani u tablici 5.

Sociodemografske značajke spol, dob, stupanj obrazovanja, bračni status i način života uvedene su u prvom koraku hijerarhijske regresijske analize. Varijable koje se odnose na zdravstveno i fizičko funkcioniranje i predoperacijski i funkcionalni status uvedeni su u drugom koraku. U trećem, zadnjem, koraku u analizu su uvedene psihosocijalne varijable mentalno zdravlje, otpornost i socijalna podrška.

Sve uvedene sociodemografske varijable, osim obrazovanja, imale su značajan doprinos objašnjenju postoperacijskog funkcionalnog statusa u prvom koraku analize. Pri tome su muški spol, niža dob, bračna veza i, iznenađujuće, samački život doprinosili boljem postoperacijskom funkcionalnom oporavku. Sociodemografske varijable zajedno su objasnile značajnih i visokih 60 % varijance kriterijske varijable. Uz kontrolu doprinosa sociodemografskih značajki, varijable zdravstvenog i funkcionalnog statusa su u drugom koraku objasnile dodatnih značajnih oko 11 % varijance postoperacijskog funkcionalnog statusa. Pritom su značajan pozitivan doprinos ostvarili predoperacijski funkcionalni status procijenjen Barthelovim indeksom i broj sati proveden u napornijim tjelesnim aktivnostima u razdoblju koje je prethodilo ozljedi i operaciji. Nakon kontrole doprinosa varijabli uvedenih u prethodna dva koraka, psihosocijalne varijable uvedene u trećem koraku hijerarhijske regresijske analize objasnile su dodatnih skromnih, ali statistički značajnih 2,7 % varijance postoperacijskog funkcionalnog statusa. Pritom niti jedna od varijabli uvedenih u trećem koraku nije imala značajan zasebni doprinos. U zadnjem koraku analize značajnim prediktorima (među svima ispitanima) pokazali su se isti oni koji su se značajnima pokazali i

In order to compare the contribution of individual groups of predictors (a) sociodemographic, b) health and functional, and c) psychosocial) to the postoperative functional recovery, a hierarchical regression analysis was further conducted, and the results are presented in Table 5.

The sociodemographic characteristics of gender, age, education level, marital status and lifestyle were introduced in the first step of the hierarchical regression analysis. The variables referring to the health and physical functioning and preoperative functional status were introduced in the second step. The psychosocial variables of mental health, resilience and social support were introduced in the third and final step.

All of the introduced sociodemographic variables, with the exception of education, significantly contributed to the explanation of the postoperative functional status in the first step of the analysis. In that regard, the male gender, younger age, marriage and, surprisingly, single life contributed to a better postoperative functional recovery. All of the sociodemographic variables together explained the significant and high 60% variance of the criterion variable. Upon controlling the contribution of sociodemographic characteristics, the health and functional status variables in the second step explained the additional significant 11% of the postoperative functional status variance. In that regard, preoperative functional status assessed using the Barthel Index and the number of hours spent engaging in more strenuous physical activities in the period preceding the injury and surgery, had a significant positive contribution. After controlling the contribution of the variables introduced in the previous two steps, the psychosocial variables introduced in the third step of the hierarchical regression analysis explained the additional modest, yet statistically significant 2.7% of the postoperative functional status variance. None of the variables introduced in the third step had a significant individual contribution. In the final step of the analysis, significant predictors (among all of those examined) were proven to be those that were significant in the standard regression analysis as well: preoperative functional

TABLICA 5. Rezultati hijerarhijske regresijske analize sa sociodemografskim karakteristikama, značajkama zdravstvenog i funkcionalnog statusa te psihosocijalnim varijablama kao prediktorima postoperacijskog funkcionalnog statusa (N=150)
TABLE 5. Results of hierarchical regression analysis with sociodemographic characteristics, health and functional status features and psychosocial variables as predictors of postoperative functional status (N=150).

	Postoperacijskifunkcionalni status (Barthelov indeks) / Postoperative functional status (Barthel Index)	
Prediktori / Predictors	**ß**	**(ß)**
1. korak / 1st step		
Sociodemografske varijable / Sociodemographic variables		
Spol (1 – muškarci, 2 – žene) / Gender (1 – male, 2 – female)	-0,16**	(-0,08)
Dob / Age	-0,58***	(-0,16)
Obrazovanje (1 – nezavršena i završena OŠ, 2 – SŠ, 3 – viša i visoka škola) / Education (1 – incomplete and completed elementary school, 2 – high school, 3 – higher education and university degree)	0,02	(-0,18*)
Bračni status (1 – u braku, 2 – samci, razvedeni, udovci) / Marital status (1 – married, 2 – single, divorced, widowed)	-0,24**	(-0,04)
Veličina kućanstva/način života (1 – žive sami, 2 – žive s nekim) / Household size/lifestyle (1 – living alone, 2 – cohabiting)	-0,19**	(-0,07)
R^2	0,616***	
Korigirani R^2 */ Adjusted* R^2	0,602***	
F (5,144)	46,174***	
2. korak / 2nd step		
Zdravstveni i funkcionalni prediktori / Health and functional predictors		
Funkcionalna sposobnost (Barthelov indeks) prije operacije / Functional capacity (Barthel Index) before surgery	0,39***	(0,34***)
Broj bolesti / Number of diseases	-0,00	(0,02)
Naporna tjelesna aktivnost / Strenuous physical activity	0,26**	(0,25**)
Umjerena tjelesna aktivnost / Moderate physical activity	0,14	(0,10)
Šetnja / Walk	-0,04	(-0,02)
Procjena boli / Pain assessment	-0,08	(-0,00)
ΔR^2	0,111***	
R^2	0,727***	
Korigirani R^2 */ Corrected* R^2	0,705***	
F (11,138)	33,362***	
3. korak / 3rd step		
Psihosocijalni prediktori / Psychosocial predictors		
Mentalno zdravlje / Mental health	0,08	(0,08)
Otpornost / Resilience	0,14	(0,15)
Socijalna podrška / Social support	0,07	(0,08)
ΔR^2	0,027*	
R^2	0,754***	
Korigirani R^2 */ Corrected* R^2	0,728***	
F (14,135)	29,550***	

*p < 0,05, **p < 0,01, ***p < 0,001
β – β-koeficijent, (β) – β-koeficijent u završnom koraku / β – β-coefficient, (β) – β-coefficient in the final step

u standardnoj regresijskoj analizi: predoperacijski funkcionalni status i uključenost u naporniје tjelesne aktivnosti kao najbolji prediktori te razina obrazovanja (koja se neočekivano pokazala negativnim prediktorom postoperacijskog funkcionalnog statusa).

RASPRAVA

Prijelom kuka jedna je od najozbiljnijih ozljeda koja se može dogoditi starijoj osobi. To je događaj koji je veliki stres za pojedinca, ali i problem za širu zajednicu pa i društvo općenito (45). Prema nekim podatcima, 37 % svih fraktura u dobi između 65 i 89 godina otpada na frakturu kuka, a 20 % lomova kuka rezultira smrću u razdoblju od godine dana od ozljede starije osobe (45). Podatci o smrtnosti variraju pa se izvješćuje o stopi smrtnosti između 8,4 % i 36 % tijekom prve godine nakon prijeloma kuka (46,47). Standardno liječenje prijeloma kuka je kirurško liječenje (48,49), koje ima 10 i 20 godišnju stopu uspješnosti od 90 do 95 %, odnosno 80-85 % (50). Međutim, nakon operacije ponekad slijede komplikacije poput dislokacije (u 8,3 % slučajeva) i infekcije (u 1,0 % slučajeva) (51-53). Nekoliko neovisnih čimbenika povezanih s povećanim rizikom od smrtnosti uključuju prijam u jedinicu intenzivne njege zbog postoperacijskih komplikacija kao što su delirij ili nedostatak kretanja (54,55), starija dob, predfrakturni komorbiditet i vrijeme između ozljede i operacije duže od 48 sati (45,56,57).

Unatoč tome što se ozljeda kuka medicinski prilično uspješno tretira, manje od polovice ozlijeđenih osoba dosegne razinu mobilnosti i funkcioniranja kakvu su imali prije ozljede (58). S obzirom na ozbiljnost mogućih posljedica prijeloma kuka kod starijih osoba i njegov nepovoljan utjecaj na kvalitetu života, izuzetno je važno identificirati ključne čimbenike u prevenciji, ali i postoperacijskom liječenju i tretmanu kada se prijelom dogodi. Danas znamo da je postoperacijski funkcionalni oporavak nakon operastatus and inclusion in more strenuous physical activities as the best predictors, as well as the education level (which, surprisingly, proved to be a negative predictor of postoperative functional status).

DISCUSSION

Hip fracture is one of the most serious injuries that could happen to an older person. Such an event is extremely stressful for the individual, but also represents a problem for the wider community and the society in general (45). According to some data, hip fractures account for 37% of all fractures that occur between the ages of 65 and 89, while 20% of hip fractures result in death in the period of one year after the elderly individual was injured (45). The data on mortality vary, therefore the mortality rate is reported between 8.4% an 36% within the first year after hip fracture (46, 47). Surgery is the standard treatment for hip fracture (48, 49), with 10- and 20-year success rates of 90% to 95%, i.e. 80% to 85% (50). However, surgery is sometimes followed by complications such as dislocation (in 8.3% of cases) and infection (in 1.0% of cases) (51-53). Several independent factors associated with an increased mortality risk include admission into intensive care units due to postoperative complications such as delirium or lack of movement (54, 55), older age, pre-fracture comorbidity and more than 48 hours passing between the injury and surgery (45, 56, 57).

Despite the fact that a hip injury is quite successfully medically treated, less than half of the injured individuals reach the levels of mobility and functioning they had before the injury (58). Considering the severity of the possible consequences of hip fracture in the elderly and its adverse impact on the quality of life, it is extremely important to identify the key factors for prevention, as well as for the postoperative care and treatment once the fracture occurs. Nowadays, we know that postoperative functional recovery after hip fracture surgery is determined

cije prijeloma kuka determiniran većim brojem čimbenika iz različitih domena, ne samo onima koji se odnose na fizičko funkcioniranje i zdravlje. U ranijim su istraživanjima zahvaćeni brojni pojedinačni prediktori kratkoročnog i dugoročnog (najčešće u razdoblju od godine dana nakon operacije) oporavka nakon operacije kuka, no njima uglavnom nisu ispitani u istom istraživanju prediktori iz različitih domena (npr. sociodemografski, tjelesni i zdravstveni te psihosocijalni čimbenici). To bi omogućilo usporedbu njihova zasebnog doprinosa uspješnosti oporavka starijih osoba nakon operacije kuka. Stoga je glavni cilj ovoga istraživanja bio utvrditi najvažnije odrednice uspješnosti funkcionalnog oporavka neposredno nakon operacije prijeloma kuka u starijih osoba, odnosno ispitati doprinose čimbenika iz različitih skupina (sociodemografski, zdravstveni i funkcionalni te psihosocijalni) uspješnosti funkcionalnog oporavka starijih osoba neposredno nakon operacije kuka, tj. na dan izlaska iz bolnice.

Rezultati istraživanja provedenog na 150 starijih osoba hospitaliziranih i operiranih zbog prijeloma kuka pokazali su da je predoperacijski funkcionalni status, procijenjen Barthelovim indeksom nakon prijma u bolnicu, bio u prosjeku dobar što ukazuje na malu ovisnost ispitanih pacijenata o tuđoj pomoći u obavljanju procijenjenih aktivnosti. Postoperacijski funkcionalni status procijenjen pomoću Barthelovog indeksa u drugoj primjeni, na dan otpusta iz bolnice, bio je značajno lošiji i, u prosjeku gledano, ukazivao je na težu ovisnost o tuđoj pomoći u razdoblju neposredno nakon operacije. To je i očekivano zbog kratkog vremena nakon operacije i potrebe za dužim postoperacijskim oporavkom.

Korelacijske analize pokazale su da su sve varijable uključene u ispitivanje međusobno značajno i uglavnom, umjereno visoko povezane. Povezanosti su bile očekivanog smjera. Primjerice, viša dob bila je značajno povezana s većim brojem kroničnih bolesti, lošijim predoperacijskim i postoperacijskim funkcionalnim statusom, s ma-

by numerous factors from different domains, not only those referring to physical functioning and health. Earlier studies included numerous individual predictors of short- and long-term recovery (most commonly in the period of one year after the surgery) after hip surgery, however the predictors pertaining to different domains (e.g. sociodemographic, physical and health, as psychosocial factors) were generally not examined together in the same studies. This would enable a comparison of their individual contributions to a successful recovery of the elderly after undergoing hip surgery. The main aim of this study was, therefore, to identify the most important determinants of successful functional recovery immediately after hip fracture surgery in elderly individuals, that is, to examine the contributions of factors from different groups (sociodemographic, health and functional, and psychosocial) to a successful functional recovery of the elderly immediately after hip surgery, i.e. on the day of discharge from the hospital.

The results of the study conducted on 150 hospitalized elderly patients who underwent hip fracture surgery showed that their average preoperative functional status, estimated using the Barthel Index after hospital admission, was good, thus indicating a low dependence of the examined patients on the help of others in performing the assessed activities. The postoperative functional status estimated using the Barthel Index in the second application, on the day of hospital discharge, was significantly worse, and on average indicated higher dependence on the help of others in the period immediately after the surgery. This was expected due to the short time that had passed after the surgery and the need for a longer postoperative recovery.

Correlation analyses have shown that all of the variables included in the assessment were significantly and mainly moderately highly intercorrelated. The correlations were expected. For example, older age had a significant correlation with a higher number of chronic diseases, worse preoperative and postoperative functional status,

nje vremena provedenog u tjelesnim aktivnostima različite razine napora, većom procjenom boli te lošijim mentalnim zdravljem, manjom psihološkom otpornošću i nižom percipiranom socijalnom podrškom. To se može objasniti lošijim zdravstvenim i funkcionalnim statusom te većom socijalnom izolacijom starijih osoba. Zanimljivo je spomenuti utvrđenu značajnu povezanost između ranije uključenosti u tjelesne aktivnosti različite razine napora s manjim doživljajem boli, boljim funkcionalnim statusom u oba mjerenja, kao i s boljim mentalnim zdravljem, otpornošću i socijalnom podrškom. Ovi nalazi ponovno potvrđuju višestruke blagotvorne učinke tjelesne aktivnosti i na tjelesno i na mentalno zdravlje te funkcionalnu sposobnost starijih osoba. Sudionici su naveli da su u razdoblju koje je neposredno prethodilo ozljedi provodili u prosjeku 4 sata tjedno u napornijoj tjelesnoj aktivnosti. Najviše vremena su provodili u šetnji (12,37 sati/tjedan) i umjerenoj tjelesnoj aktivnosti (11,62 sati/tjedan). Ovi podatci ukazuju na relativno zadovoljavajuću razinu tjelesne aktivnosti u ovoj skupini starijih osoba u razdoblju prije operacije.

Pokazalo se da je funkcionalni status nakon operacije bio značajno i većinski umjereno visoko povezan s gotovo svim ispitanim prediktorskim varijablama. Dobiveni rezultati pokazuju da je uspješniji postooperacijski funkcionalni oporavak značajno povezan s boljim predoperativnim funkcionalnim statusom, manjim brojem kroničnih bolesti, većom ranijom uključenošću u različite razine tjelesne aktivnosti (naporna, umjerena tjelesna aktivnost i šetnja), s manjim doživljajem boli, s boljim mentalnim zdravljem te s izraženijom psihološkom otpornošću i većom percipiranom socijalnom podrškom. To je sukladno rezultatima nekih ranijih istraživanja (15-17,20-23,25,29,30,56).

Rezultati provedenih regresijskih analiza pokazali su da su predoperacijski funkcionalni status i broj sati proveden u napornijoj tjelesnoj aktivnosti u razdoblju neposredno prije ozljede

less time spent engaging in physical activities of various levels of effort, higher pain assessment and worse mental health, lower psychological resilience and lower perceived social support. This can be explained by a lower health and functional status and higher social isolation of the elderly. Interestingly, a significant association was found between previous participation in physical activities of varying levels of effort and experiencing less pain, presenting a better functional status in both assessments, as well as better mental health, resilience, and social support. These findings again confirm the multiple benefits of physical activity on the physical and mental health and functional capacity of the elderly. The participants reported spending an average of four hours per week engaging in more strenuous physical activity in the period immediately preceding the injury. They spent most of the time walking (12.37 hours/week) and engaging in moderate physical activity (11.62 hours/week). These data indicate a relatively satisfactory level of physical activity in this group of elderly individuals in the period before the surgery.

The functional status after surgery has been shown to have a significant and mainly moderately high correlation with almost all examined predictor variables. The obtained results indicate that successful postoperative functional recovery is significantly associated with a better preoperative functional status, fewer chronic diseases, greater previous involvement in various levels of physical activity (strenuous, moderate physical activity and walking), less intense pain, better mental health and more pronounced psychological resilience, as well as higher perceived social support. This is consistent with the results of some earlier studies (15-17, 20-23 ,25, 29, 30, 56).

The results of the conducted regression analyses have shown that the preoperative functional status and the number of hours spent engaging in more strenuous physical activity in the period immediately before the injury are the best predictors of postoperative functional status.

najbolji prediktori postoperacijskog funkcionalnog statusa. Pritom je najznačajniji prediktor bio predoperacijski funkcionalni status. To je i očekivano budući da se radi o istom području procjene, istim instrumentom, tj. o procjeni funkcionalne sposobnosti u dva navrata. Ovaj je nalaz sukladan nekim ranijim nalazima koji također potvrđuju ključnu ulogu predoperacijskog funkcionalnog statusa u predviđanju postoperacijskog oporavka (20-23).

O važnosti tjelesne aktivnosti za očuvanje zdravlja i funkcionalne sposobnosti već je dosta toga rečeno u uvodu. Ovdje ćemo samo naglasiti da ona pomaže očuvanju pokretljivosti što osobi omogućuje lakše zadovoljenje temeljnih potreba te potreba za sudjelovanjem u društvenim interakcijama uz povećanje osjećaja samoefikasnosti i zadovoljstva (60). Tjelesna aktivnost ne samo da smanjuje rizik padova u starijoj dobi, nego i pomaže oporavku narušenog funkcionalnog statusa (25). U ovom se istraživanju posebno važnom pokazala naprornija tjelesna aktivnost, možda zato što većina starijih osoba prakticira u određenoj mjeri tjelesne aktivnosti umjerenog intenziteta i šetnju. Stoga je moguće da je upravo veći angažman u napornijim tjelesnim aktivnostima, koji je rjeđi u starijih osoba, onaj koji bitnije doprinosi očuvanju ili kasnijem postoperacijskom oporavku funkcionalnog statusa.

Hijerarhijska regresijska analiza potvrdila je također značajan doprinos nekih sociodemografskih varijabli postoperacijskom funkcionalnom oporavku. Muški spol, niža dob i bračna veza doprinosili su boljem oporavku. Ovi su rezultati u skladu s nalazima nekih ranijih istraživanja koja su pokazala da su starija dob (18,20-22,27,61) i život izvan braka (16) povezani s lošijim funkcionalnim oporavkom neposredno nakon ili u razdoblju od godine dana poslije operacije kuka. Također su utvrđene spolne razlike sukladne ranijim dobro potvrđenim nalazima o općenito više ograničenja u funkcionalnoj sposobnosti i kretanju u žena u usporedbi

In that sense, the most important predictor was the preoperative functional status. This was to be expected, since it involves the same assessment scope, the same instrument, i.e. assessment of functional capacity conducted on two occasions. These findings are consistent with some earlier findings that also confirm the key role of preoperative functional status in predicting postoperative recovery (20-23).

The importance of physical activity for the preservation of health and functional capacity has already been extensively discussed in the introduction. At this point, we will only emphasize that it helps maintain mobility, thus making it easier for the individual to meet their basic needs and the needs to participate in social interactions, in addition to increasing the sense of self-efficacy and satisfaction (60). Physical activity not only reduces the risk of falls in older age, but also helps in the recovery of an impaired functional status (25). More strenuous physical activity has proven to be particularly important in this study, perhaps because the majority of elderly individuals engage in physical activities of moderate intensity and strolls to a certain extent. It is, therefore, possible that precisely higher engagement in more strenuous physical activities, which is less frequent among the elderly, is the factor that largely contributes to the preservation of functional status and its later postoperative recovery.

Hierarchical regression analysis has also confirmed the significant contribution of some sociodemographic variables to postoperative functional recovery. The male gender, younger age and marriage contributed to a better recovery. These results are consistent with those of some previous studies which showed that older age (18, 20-22, 27, 61) and life outside of marriage (16) were associated with poorer functional recovery immediately after or in the period within a year after the hip surgery. Gender differences were also confirmed consistent with the earlier well-established findings on the generally more limited functional capacity and movement of women compared to men in the

s muškarcima u općoj populaciji starijih osoba, iako nisu u skladu s nekim nalazima o lošijem funkcionalnom oporavku muškaraca nakon operacije prijeloma kuka (27).

Psihosocijalne varijable, uz kontrolu sociodemografskih i varijabli zdravstvenog i predoperacijskog funkcionalnog statusa, objasnile su dodatnih skromnih ali statistički značajnih 2,7 % varijance postoperacijskog funkcionalnog statusa, ali niti mentalno zdravlje, niti psihološka otpornost, niti socijalna podrška, suprotno očekivanjima, nisu imali značajan zasebni doprinos. Uloga psihološke otpornosti u nošenju sa stresorima kao što su prijelom i operacija kuka te u nošenju s izazovima postoperacijskog oporavka uglavnom je u ranijim istraživanjima bila zanemarena. Mentalno zdravlje, odnosno uloga depresivnosti i anksioznosti dijelom je zahvaćena u ranijim istraživanjima, koja ukazuju na lošiji funkcionalni oporavak osoba s izraženijom predoperacijskom ili postoperacijskom anksioznošću i depresivnošću (22,26,27). Nalazi koji se odnose na ulogu socijalne podrške u postoperacijskom oporavku nisu suglasni. Neki ukazuju na značajnu ulogu socijalne podrške u procesu oporavka (17), dok drugi ne potvrđuju njezinu značajniju ulogu (62). Također, rezultati pojedinih istraživanja pokazuju da doprinos različitih vrsta socijalne podrške (npr. emocionalne ili instrumentalne) varira ovisno o vremenu koje je prošlo od operacije (27).

Na kraju treba spomenuti i ograničenja ovoga istraživanja koja se u prvom redu odnose na mali i nereprezentativni uzorak zbog toga što su sudionici regrutirani u samo jednoj ustanovi. To smanjuje mogućnost generalizacije dobivenih rezultata na čitavu populaciju hrvatskih pacijenata operiranih zbog prijeloma kuka. Nadalje, postoperacijski funkcionalni status procijenjen je kratko nakon operacije prijeloma kuka. Opetovane procjene nakon dužih razdoblja nakon operacije također bi bile poželjne kako bi se mogao kontinuirano pratiti funkcionalni oporavak tijekom dužeg razdoblja te čimbenici koji na njega utječu.

general elderly population, although they are not consistent with some findings on the poorer functional recovery of men after hip fracture surgery (27).

In addition to the control of sociodemographic, as well as health and preoperative functional status variables, the psychosocial variables have explained the additional modest, yet statistically significant 2.7% variance in the postoperative functional status. However, contrary to expectations, neither mental health, psychological resilience, nor social support have had a significant contribution. The role of psychological resilience in coping with stressors such as hip fracture and surgery, and in coping with the challenges of postoperative recovery, was mainly neglected in previous studies. Mental health, i.e. the role of depression and anxiety, was partially included in the earlier studies, which indicated a poorer functional recovery of the individuals with more pronounced preoperative or postoperative anxiety and depression (22, 26, 27). The findings relating to the role of social support in postoperative recovery were inconsistent. Some indicate a significant role of social support in the recovery process (17), while others do not confirm its significant role (62). Furthermore, the results of some studies indicate that the contribution of different types of social support (e.g. emotional or instrumental) varies depending on the time passed since the surgery (27).

Finally, the limitations of this study should also be mentioned, as they primarily relate to the small and nonrepresentative sample due to the fact that all of the participants were recruited in one institution. This reduces the possibility of generalizing the obtained results to the entire population of Croatian patients who underwent hip fracture surgery. Moreover, the postoperative functional status was assessed shortly after the hip fracture surgery. It would also be advisable to conduct repeated assessments after longer periods following the surgery, so that functional recovery, and the factors influencing it, could be continuously monitored over a longer period.

ZAKLJUČAK

Rezultati ovoga istraživanja potvrđuju značajnu ulogu sociodemografskih obilježja, ranijeg funkcionalnog statusa te ranije uključenosti u napornije tjelesne aktivnosti u postoperacijskom funkcionalnom oporavku starijih osoba neposredno nakon operacije prijeloma kuka. Ipak, rezultati ne potvrđuju veću ulogu ispitanih psihosocijalnih resursa u postoperacijskom funkcionalnom oporavku neposredno nakon operacije, ali oni bi mogli imati značajniju ulogu u dugoročnijem oporavku.

Budući da je postoperacijski funkcionalni status zasigurno pod utjecajem velikog broja čimbenika koji su međusobno isprepleteni, a koje nije sve bilo moguće predvidjeti niti zahvatiti ovim istraživanjem, ostaje još dovoljno prostora za buduća istraživanja u ovom području. Ta su istraživanja izuzetno važna i zbog svojih praktičnih implikacija. Naime, identificiranje i osnaživanje onih čimbenika na koje se može djelovati, a koji olakšavaju oporavak pacijenata nakon operacije prijeloma kuka ubrzalo bi njihov oporavak, pridonijelo njihovoj kvaliteti života, ali i potencijalno smanjilo korištenje lijekova i broj dana hospitalizacije.

CONCLUSION

The results of this study point to a significant role of sociodemographic characteristics, previous functional status and early involvement in more strenuous physical activity in the postoperative functional recovery of elderly individuals immediately after hip fracture surgery. Nevertheless, the results do not confirm a more significant role of the assessed psychosocial resources in the postoperative functional recovery immediately after surgery, but they could play a more significant role in long-term recovery.

Since the postoperative functional status is surely influenced by numerous interconnected factors, all of which could not have been predicted or included in this study, enough room is left for future studies in this field. These studies are extremely important due to their practical implications. Indeed, identifying and strengthening those factors that can be influenced, and which facilitate the recovery of patients after hip fracture surgery, would accelerate their recovery, contribute to their quality of life, and would potentially reduce medication use and the number of days spent at the hospital.

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