

Translation and adaptation of the Gross Motor Function Measure-88 to the Croatian language

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The Gross Motor Function Measure-88 (GMFM-88) is a standardized observational instrument measuring gross motor function for children with cerebral palsy and Down syndrome. Clinicians in Croatia have been showing a growing interest in GMFM-88. However, only the English version of the measure was available, which possessed a barrier for its use in Croatia. The aim of this study was to translate the GMFM-88 test from English into Croatian and adapt it for use in clinical practice in Croatia. In this study, we followed the first five steps of the Sousa & Rojjanasrirat (2010) guideline for translation and adaptation. First, two authors independently did "forward" translation; a translation of the score sheet from English into Croatian. Then, the third author performed "backward" translation, which was checked and revised by the measure's author. The pre-final version of the translated measure was tested through cognitive debriefing with seven clinicians. Participants pointed out the importance of the consistent use of terms and provided suggestions for improvement, such as changed word order or shortening of the translated items. Seventy two of 88 items were changed. With this study, we have initiated the adaptation of the GMFM-88 to Croatian. The next steps for fully validated GMFM-88 in the Croatian language is to do psychometric testing with children with cerebral palsy and Down syndrome in Croatia.

Key words: ADAPTATION; CEREBRAL PALSY; DOWN SYNDROME; TRANSLATION

INTRODUCTION

The instrument used for the evaluation of gross motor functions (Gross Motor Function Measure-88 – GMFM-88) is a standardized observational instrument for evaluating the gross motor functions of children with cerebral palsy and Down syndrome (1). The original version of the test consists of 88 tasks divided into five measurement dimensions: A) Lying and turning (17 items), B) Sitting (20 items), C) Crawling (14 items), D) Standing (13 items), and E) Walking, running and jumping (24 items) (2). A shorter version of the GMFM-88 was made – GMFM-66 – requiring less time to conduct the test, while still allowing the calculation of the overall result without assessing all the items. The minimum number of estimated items to obtain a total result on the GMFM-66 test is 13 (2).

The items are scored from 0 to 3 as follows: 0 – does not perform the task (does not start the performance), 1 – starts the performance of the task (performs less than 10% of the

task), 2 – partially performs the task (performs between 10 and 100% of tasks), 3 – performs the task completely and NT – is not tested (only in the GMFM-66 version) (2). Gross Motor Ability Estimator (GMAE-2) computer software can be used for input, analysis and interpretation of results (3).

GMFM allows for an evaluation of movement and movement skills in lying, sitting, four-legged, kneeling and standing positions and transitions between these positions. The measure has been validated and is reliable for measuring gross motor skills in children with cerebral palsy and Down syndrome. It is considered the "gold standard" for evaluating

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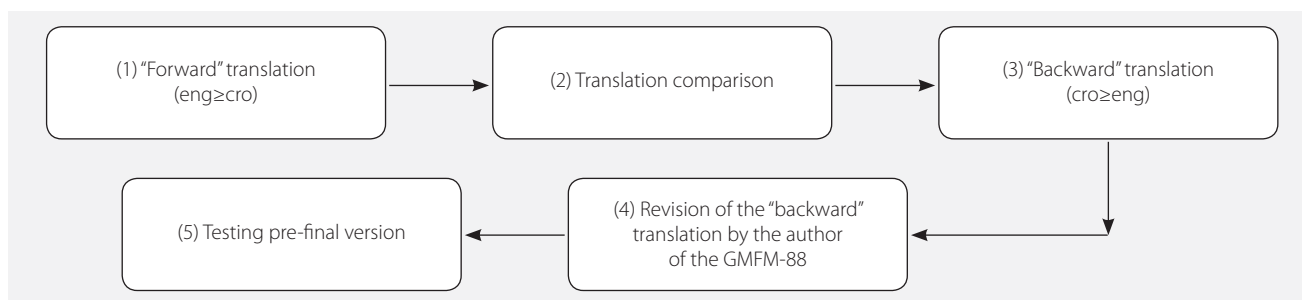


FIGURE 1. Steps carried out to translate the GMFM-88 test from English into Croatian

gross motor functioning (4, 5, 6). To date, it has officially been translated to five languages: Dutch, Norwegian, Portuguese, Korean and Spanish (7).

For therapists working with children with cerebral palsy, an objective measuring instrument is of great importance for everyday work (8). Due to the availability, comprehensiveness and the existing computer software GMAE-2, GMFM offers therapists a quality tool for use in everyday practice.

In the last 20 years, there has been a growing interest for the GMFM use by Croatian therapists. As a result, several professional trainings have been held in Croatia with the aim of raising awareness about the existence of GMFM, as well as teaching about its use in working with children with cerebral palsy. The first professional development in Croatia, which included the presentation of the GMFM-88 measure and the GMFCS classification, was held in 2003 in the organization of the Academy of Developmental Rehabilitation. Professional developments from GMFM in Croatia have been continuously held over the past seventeen years (2007, 2011, 2012, 2015, 2016, 2020, 2021 and 2022) (H. Gudlin, personal communication, September 10, 2020). Given the increasing number of therapists in Croatia who want to use GMFM in practice, there has been a recognized need for the translation and adaptation of GMFM-88 to Croatian. Before, the original English version of the test or an informal translation to Croatian were used in Croatia. The aim of this study was to translate the GMFM-88 score sheet from English into Croatian – following scientific guidelines for translation, cultural adaptation and validation of the instrument, in order to enable therapists in Croatia to use GMFM-88 in Croatian.

METHODS

In this study, we followed the first five modified steps of the *Sousa and Rojjanasirirat* (9) guidelines for the translation and adaptation of the GMFM-88 score sheet: (1) translation of the score sheet into Croatian by the “forward” method, (2) translation comparison, (3) repeated translation of the Croatian version into English with “backward” method, (4) verifi-

cation of translations with the author of the GMFM measure and (5) testing of the pre-final version of the translated GMFM-88 measure.

The first step was to translate the score sheet into Croatian by the so-called “forward” method. Two authors (DH and HG) independently translated the score sheet from English into Croatian. Both authors are native speakers of Croatian and are active users of English. HG, Master of physiotherapy, works with children with developmental disabilities, uses GMFM frequently in practice and is leading the professional trainings ‘System of classification of gross motor functioning (GMFCS)’ and ‘Evaluation of gross motor functions (GMFM)’ at the Academy of Developmental Rehabilitation in Croatia. Another author, DH, who participated in the “forward” translation is a Bachelor of physiotherapy and participated in the professional education of the Gross Motor Functioning Classification System (GMFCS) and The Evaluation of Gross Motor Functions (GMFM) held in June 2020 organized by the Academy of Developmental Rehabilitation. The second step was to compare the translations of both authors and together develop a Croatian version of the translated score sheet.

The third step was a repeated translation of the Croatian version of the test into English, the so-called “backward” translation, which was done by the third author (MNP). MNP is a bilingual (English and Croatian) Bachelor of physiotherapy who also holds a Master's degree in Educational Rehabilitation. She also worked with children with cerebral palsy and used GMFM clinically. MNP has also completed professional development course on the Gross Motor Functioning Classification System (GMFCS) and gross motor function evaluation (GMFM) at the Academy of Developmental Rehabilitation. The “backward” translation was subsequently revised and verified by the author of the original English-language GMFM test, *Dr. Dianne Russell*. *Dr Russell* offered several proposals to improve the translation of the instrument, some of which had been adopted, while others were rejected after a joint discussion. The proposed changes were taken into account if they did not change the meaning of the item in the Croatian language or if the proposed amendment was in accordance with the meaning in Croatian.

TABLE 1. Participant demographics

Participant	1.	2.	3.	4.	5.	6.	7.
Gender	F	F	F	F	F	F	F
Age	32	27	45	35	58	33	55
Occupation	PT	Education rehabilitator	PT	PT	Education rehabilitator	PT	Kinesiologist
Years of work experience	5	3	22	10	32	12	31
Years of work experience with children with developmental disabilities	5	3	22	5	30	9	15

F – female, PT – physiotherapist

In the last step, the so-called “cognitive debriefing”, we tested the pre-final version of the GMFM-88 instrument with a group of participants who are native speakers of Croatian through individual qualitative interviews. We found the participants in partnership with the Academy of Developmental Rehabilitation where we were granted access to the list of professional training attendees on the GMFCS system and the GMFM-88 measure. We sent them an e-mail invitation describing the research and its steps. We also searched for respondents through social networks, i.e. through Facebook groups whose members included therapists and medical doctors. The inclusion criteria for participating in the study was professional experience in working with children with disabilities. Before starting the study, respondents had to sign a “Participant consent form”. The respondents who agreed to participate and signed the consent first received an e-mail with instructions for participation in the research. They also received a GMFM-88 score sheet in English and a pre-final version of the translation in Croatian. They were told to indicate whether the items were “clear” or “unclear” in Croatian and were asked to offer a suggestion to improve the translation of the item if “unclear”. They also received a short questionnaire with demographic questions, questions about their work experience with children with cerebral palsy and their previous experiences with the GMFM test. After comparing the English GMFM-88 score sheet with the Croatian translation and filling out the questionnaire, an individual qualitative interview was arranged. The interviews took place on Zoom (10) where the respondents had the opportunity to further explain their understanding of translations and their suggestions for improvement. The subjects also commented on those items that previous subjects had marked as “unclear” and were asked for their opinion on the suggested iteration of an item. This research received the approval of the Ethics Committee of the University of Applied Health Sciences in Zagreb on 1 July 2020.

PARTICIPANTS

The first invitation to participate in the research was sent via e-mail to 68 clinicians, of whom 31 responded positively.

They were sent an instruction for further research steps and the “Participant consent form” that they needed to sign. Participants in the study were contacted exclusively through e-mail addresses. All applicants received an email with instructions for the next steps in the study and a “Participant consent form” twice. Of the 31 potential participants, 24 clinicians were excluded from the survey as they could not be contacted for further steps or gave up participating in this study. Qualitative interviews were conducted with seven clinicians.

When examining demographic characteristics, respondents were asked about gender, age, occupation, years of work experience and years of work experience with children with developmental disabilities. All subjects were female of an average age of 40.7 years. Of the seven subjects, four were physiotherapists, two were educational rehabilitators and one was a kinesiologist. The average number of years of total work experience was 16.4 years, 12.7 of which was work experience with children with developmental disabilities (Table 1).

RESULTS

Following the interviews and analysis of the results, 72 out of 88 items were changed (Table 2). Through qualitative interviews, we have received useful information and suggestions on how to adapt GMFM-88 to the Croatian language and culture. Most of the suggestions for changes in the items of the instrument were related to the word order or shortening of items, with a focus on keeping the meaning unchanged. The participants also pointed to unintentionally omitted words that had great importance for the complete translation of the items. Several respondents emphasized the importance of the consistent use of words throughout the test. A detailed overview of the item changes through each phase of research can be found in Table 2.

DISCUSSION

This study includes the translation of the GMFM-88 score sheet from English to Croatian and was conducted on a

TABLE 2.

English (original)	Croatian – prefinal version	Croatian – final version
LYING & ROLLING	LEŽANJE I OKRETANJE	LEŽANJE I OKRETANJE
1. SUP, HEAD IN MIDLINE: turns head with extremities symmetrical	Leži na leđima, glava u središnjoj liniji: okreće glavu, udovi simetrično	Leži na leđima, glava u središnjoj liniji: okreće glavu, udovi simetrični
2. SUP: brings hands to midline, fingers one with the other	Leži na leđima: dovodi ruke u središnju liniju, isprepliče prste	Leži na leđima: dovodi ruke u središnju liniju, isprepliče prste
3. SUP: lifts head 45°	Leži na leđima: odize glavu 45°	Leži na leđima: odize glavu 45°
4. SUP: flexes R hip & knee through full range	Leži na leđima: savija desni kuk i koljeno kroz puni opseg pokreta	Leži na leđima: flektira desni kuk i koljeno kroz puni opseg pokreta
5. SUP: flexes L hip & knee through full range	Leži na leđima: savija lijevi kuk i koljeno kroz puni opseg pokreta	Leži na leđima: flektira lijevi kuk i koljeno kroz puni opseg pokreta
6. SUP: Reaches out with R arm, hand crosses midline toward toy	Leži na leđima: poseže desnom rukom, ruka prelazi središnju liniju	Leži na leđima: poseže desnom rukom prema igrački, ruka prelazi središnju liniju
7. SUP: reaches out with L arm, hand crosses midline toward toy	Leži na leđima: poseže lijevom rukom, ruka prelazi središnju liniju	Leži na leđima: poseže lijevom rukom prema igrački, ruka prelazi središnju liniju
8. SUP: rolls to PR over R side	Leži na leđima: okreće se u ležeći položaj na trbuhu preko desne strane	Leži na leđima: okreće se u potrbušni preko desne strane
9. SUP: rolls to PR over L side	Ležeći položaj: okreće se u ležeći položaj na trbuhu preko lijeve strane	Leži na leđima: okreće se u potrbušni preko lijeve strane
10. PR: lifts head upright	Leži na trbuhu: odize glavu uspravno prema gore	Leži na trbuhu: odize glavu uspravno od podloge
11. PR ON FOREARMS: lifts head upright, elbows ext., chest raised	Leži na trbuhu uz oslonac na podlaktice: odize glavu uspravno, laktovi ispruženi, prsa odignuta od podloge	Leži na trbuhu uz oslonac na podlaktice: odize glavu uspravno, laktovi ispruženi, prsa odignuta od podloge
12. PR ON FOREARMS: weight on R forearm, fully extends opposite arm forward	Leži na trbuhu uz oslonac na podlaktice: prenosi težinu na desnu podlakticu, potpuno ispruža suprotnu ruku prema naprijed	Leži na trbuhu uz oslonac na podlaktice: prenosi težinu na desnu podlakticu, potpuno ispruža suprotnu ruku prema naprijed
13. PR ON FOREARMS: weight on L forearm, fully extends opposite arm forward	Leži na trbuhu uz oslonac na podlaktice: prenosi težinu na lijevu podlakticu, potpuno ispruža suprotnu ruku prema naprijed	Leži na trbuhu uz oslonac na podlaktice: prenosi težinu na lijevu podlakticu, potpuno ispruža suprotnu ruku prema naprijed
14. PR: rolls to SUP over R side	Leži na trbuhu: okreće se do ležećeg položaja na leđima preko desne strane tijela	Leži na trbuhu: okreće se u ležeći položaj na leđima preko desne strane tijela
15. PR: rolls to sup over L side	Leži na trbuhu: okreće se do ležećeg položaja na leđima preko lijeve strane tijela	Leži na trbuhu: okreće u ležeći položaj na leđima preko lijeve strane tijela
16. PR: pivots to R 90° using extremities	Leži na trbuhu: pivotira udesno 90° koristeći udove	Leži na trbuhu: kruži na trbuhu (pivotira) udesno 90° koristeći ekstremitete
17. PR: pivots to L 90° using extremities	Leži na trbuhu: pivotira ulijevo 90° koristeći udove	Leži na trbuhu: kruži na trbuhu (pivotira) ulijevo 90° koristeći ekstremitete
SITTING	SJEDENJE	SJEDENJE
18. SUP, HANDS GRASPED BY EXAMINER: pulls self to sitting with head control	Leži na leđima, rukama se uhvati za ispitivača: povlači se u sjedeći položaj uz kontrolu glave	Leži na leđima, ispitivač drži dijete za ruke: povlači se u sjedeći položaj kontrolirajući glavu
19. SUP: rolls to R side, attains sitting	Leži na leđima: okreće se udesno, postiže sjedeći položaj	Leži na leđima: okreće se u desnu stranu, posjeda se
20. SUP: rolls to L side, attains sitting	Leži na leđima: okreće se ulijevo, postiže sjedeći položaj	Leži na leđima: okreće se u lijevu stranu, posjeda se
21. SIT ON MAT, SUPPORTED AT THORAX BY THERAPIST: lifts head upright maintains 3 seconds	Sjedi na strunjači, terapeut podupire trup: odize glavu uspravno, zadržava položaj 3 sekunde	Sjedi na strunjači, terapeut podupire trup: odize glavu uspravno, zadržava 3 sekunde
22. SIT ON MAT, SUPPORTED AT THORAX BY THERAPIST: lifts head midline, maintains 10 seconds	Sjedi na strunjači, terapeut podupire trup: odize glavu u središnjoj liniji, zadržava položaj 10 sekundi	Sjedi na strunjači, terapeut podupire trup: odize glavu u središnjoj liniji, zadržava 10 sekundi
23. Sit ON MAT, ARM(S) PROPPING: maintains, 5 seconds	Sjedi na strunjači, podupire se rukom/rukama: zadržava položaj 5 sekundi	Sjedi na strunjači, podupire se rukom/rukama: zadržava 5 sekundi
24. SIT ON MAT: maintain, arms free, 3 seconds	Sjedi na strunjači: zadržava, ruke slobodne, 3 sekunde	Sjedi na strunjači: zadržava 3 sekunde, ruke slobodne

TABLE 2. Continued

English (original)	Croatian – prefinal version	Croatian – final version
25. SIT ON MAT WITH SMALL TOY IN FRONT: leans forward, touches toy, re-erects without arm propping	Sjedi na strunjači, mala igračka ispred: naginje se naprijed, dodiruje igračku, uspravlja se u sjedeći položaj bez podupiranja rukama	Sjedi na strunjači, mala igračka ispred: naginje se naprijed, dodiruje igračku, vraća se nazad bez podupiranja rukama
26. SIT ON MAT: touches toy places 45° behind child's R side, returns to start	Sjedi na strunjači: dodiruje igračku postavljenu 45° iza desne strane, vraća se u početnu poziciju	Sjedi na strunjači: dodiruje igračku postavljenu 45° iza djetetove desne strane, vraća se nazad
27. SIT ON MAT: touches toy places 45° behind child's L side, returns to start	Sjedi na strunjači: dodiruje igračku postavljenu 45° iza lijeve strane, vraća se u početnu poziciju	Sjedi na strunjači: dodiruje igračku postavljenu 45° iza djetetove lijeve strane, vraća se nazad
28. R SIDE SIT: maintains, arms free, 5 seconds	Desni postranični sjedeći položaj: zadržava bez podupiranja rukama 5 sekundi	Desni postranični sjed: zadržava 5 sekundi, ruke slobodne
29. L SIDE SIT: maintains, arms free, 5 seconds	Lijevi postranični položaj: zadržava bez podupiranja rukama 5 sekundi	Lijevi postranični sjed: zadržava 5 sekundi, ruke slobodne
30. SIT ON MAT: lowers to PR with control	Sjedi na strunjači: kontrolirano se spušta u ležeći položaj na trbuhu	Sjedi na strunjači: kontrolirano se spušta u potrbušni
31. SIT ON MAT WITH FEET IN FRONT: attains 4 point over R side	Sjedi na strunjači s ispruženim nogama: postiže četveronožni položaj preko desne strane tijela	Sjedi na strunjači s ispruženim nogama: postiže četveronožni položaj preko desne strane
32. SIT ON MAT WITH FEET IN FRONT: attains 4 point over L side	Sjedi na strunjači s ispruženim nogama: postiže četveronožni položaj preko lijeve strane tijela	Sjedi na strunjači s ispruženim nogama: postiže četveronožni položaj preko lijeve strane
33. SIT ON MAT: pivots 90°, without arms assisting	Sjedi na strunjači: pivotira 90°, bez podupiranja rukama	Sjedi na strunjači: kruži (pivotira) 90°, bez pomoći ruku
34. SIT ON BENCH: maintains, arms and feet free, 10 seconds	Sjedi na klupici: zadržava 10 sekundi, ruke i stopala slobodni	Sjedi na klupi: zadržava 10 sekundi, ruke i stopala slobodni
35. STD: attains sit on small bench	Stoji: postiže sjedeći položaj na maloj klupici	Stoji: posjeda se na nisku klupu
36. ON THE FLOOR: attains sit on small bench	Na podu: postiže sjedeći položaj na maloj klupi	Na podu: posjeda se na nisku klupu
37. ON THE FLOOR: attains sit on large bench	Na podu: postiže sjedeći položaj na velikoj klupi	Na podu: posjeda se na visoku klupu
CRAWLING & KNEELING	PUZANJE I KLEČANJE	PUZANJE I KLEČANJE
38. PR: creeps forward 1.8m (6')	Leži na trbuhu: gmiže unaprijed 1.8 m	Leži na trbuhu: gmiže prema naprijed 1.8 m
39. 4 POINT: maintains, weight on hands and knees, 10 seconds	Četveronožni položaj: zadržava položaj 10 sekundi, težina je na rukama i koljenima	Četveronožni položaj: zadržava 10 sekundi, težina na rukama i koljenima
40. 4 POINT: attains sit arms free	Četveronožni položaj: postiže sjedeći položaj bez pomoći ruku	Četveronožni položaj: posjeda se, ruke slobodne
41. PR: attains 4 point, weight on hands and knees	Leži na trbuhu: postiže četveronožni položaj, oslonac na rukama i koljenima	Leži na trbuhu: postiže četveronožni položaj, težina na rukama i koljenima
42. 4 POINT: reaches forward with R arm, hand above shoulder level	Četveronožni položaj: poseže desnom rukom, ruka iznad razine ramena	Četveronožni položaj: poseže desnom rukom prema naprijed, ruka iznad razine ramena
43. 4 POINT: reaches forward with L arm, hand above shoulder level	Četveronožni položaj: poseže lijevom rukom, ruka iznad razine ramena	Četveronožni položaj: poseže lijevom rukom prema naprijed, ruka iznad razine ramena
44. 4 POINT: crawls or hitches forward 1.8m (6')	Četveronožni položaj: puže ili se povlači unaprijed 1.8 m	Četveronožni položaj: puže ili se povlači prema naprijed 1.8 m
45. 4 POINT: crawls reciprocally forward 1.8m (6')	Četveronožni položaj: recipročno puže unaprijed 1.8 m	Četveronožni položaj: naizmjenično puže prema naprijed 1.8 m
46. 4 POINT: crawls up 4 steps on hands and knees/feet	Četveronožni položaj: puže 4 stepenice prema gore, na rukama i koljenima/stopalima	Četveronožni položaj: puže 4 stepenice prema gore, na rukama i koljenima/stopalima
47. 4 POINT: crawls backwards down 4 steps on hands and knees/feet	Četveronožni položaj: puže unatrag 4 stepenice prema dolje, na rukama i koljenima/stopalima	Četveronožni položaj: puže unazad 4 stepenice prema dolje, na rukama i koljenima/stopalima
48. SIT ON MAT: attains high KN using arms, maintains, arms free, 10 seconds	Sjedi na strunjači: postiže visoki klečeći položaj koristeći ruke za potporu, zadržava sa slobodnim rukama, 10 sekundi	Sjedi na strunjači: postiže visoki klečeći položaj koristeći ruke, zadržava 10 sekundi, ruke slobodne

TABLE 2. Continued

English (original)	Croatian – prefinal version	Croatian – final version
49. HIGH KN: attains half KN on R knee using arms, maintains, arms free, 10 seconds	Visoki klečeći položaj: postiže klečeći položaj na desnom koljenu koristeći ruke, zadržava sa slobodnim rukama, 10 sekundi	Visoki klečeći položaj: postiže polu klečeći položaj na desnom koljenu koristeći ruke, zadržava 10 sekundi, ruke slobodne
50. HIGH KN: attains half KN on L knee using arms, maintains, arms free, 10 seconds	Visoki klečeći položaj: postiže klečeći položaj na lijevom koljenu koristeći ruke, zadržava sa slobodnim rukama, 10 sekundi	Visoki klečeći položaj: postiže polu klečeći položaj na lijevom koljenu koristeći ruke, zadržava 10 sekundi, ruke slobodne
51. HIGH KN: KN walks forward 10 steps, arms free	Visoki klečeći položaj: hoda na koljenima unaprijed 10 koraka bez pomoći ruku	Visoki klečeći položaj: hoda na koljenima prema naprijed 10 koraka, ruke slobodne
STANDING	STAJANJE	
52. ON THE FLOOR: pulls to STD at large bench	Na podu: povlači se u stojeći položaj uz veliku klupu	Na podu: povlači se u stojeći položaj uz visoku klupu
53. STD: maintains, arms free, 3 seconds	Stojeći položaj: zadržava, ruke slobodne, 3 sekunde	Stoji: zadržava 3 sekunde, ruke slobodne
54. STD: holding on to large bench with one hand, lifts R foot, 3 seconds	Stojeći položaj: pridržava se za veliku klupu jednom rukom, odiže desno stopalo, zadržava 3 sekunde	Stoji: jednom rukom se pridržava za visoku klupu, odiže desno stopalo, zadržava 3 sekunde
55. STD: holding on to large bench with one hand, lifts L foot, 3 seconds	Stojeći položaj: pridržava se za veliku klupu jednom rukom, odiže lijevo stopalo, zadržava 3 sekunde	Stoji: jednom rukom se pridržava za visoku klupu, odiže lijevo stopalo, zadržava 3 sekunde
56. STD: maintains, arms free, 20 seconds	Stojeći položaj: zadržava, ruke slobodne, 20 sekundi	Stoji: zadržava 20 sekundi, ruke slobodne
57. STD: lifts L foot, arms free, 10 seconds	Stojeći položaj: odiže lijevo stopalo, ruke slobodne, 10 sekundi	Stoji: odiže lijevo stopalo, ruke slobodne, 10 sekundi
58. STD: lifts R foot, arms free, 10 seconds	Stojeći položaj: odiže desno stopalo, ruke slobodne, 10 sekundi	Stoji: odiže desno stopalo, ruke slobodne, 10 sekundi
59. SIT ON SMALL BENCH: attains STD without using arms	Sjedi na maloj klupi: postiže stojeći položaj bez podupiranja rukama	Sjedi na niskoj klupi: postiže stojeći položaj bez korištenja ruku
60. HIGH KN: attains STD through half KN on R knee, without using arms	Visoki klečeći položaj: postiže stojeći položaj kroz iskorak na desnom koljenu, bez podupiranja rukama	Visoki klečeći položaj: postiže stojeći položaj kroz iskorak na desnom koljenu, bez korištenja ruku
61. HIGH KN: attains STD through half KN on L knee, without using arms	Visoki klečeći položaj: postiže stojeći položaj kroz iskorak na lijevom koljenu, bez podupiranja rukama	Visoki klečeći položaj: postiže stojeći položaj kroz iskorak na lijevom koljenu, bez korištenja ruku
62. STD: lowers to sit on floor with control, arms free	Stojeći položaj: spušta se kontrolirano u sjedeći položaj na podu, bez podupiranja rukama	Stoji: spušta se kontrolirano u sjedeći položaj na podu, ruke slobodne
63. STD: attains squat, arms free	Stojeći položaj: postiže čučanj, ruke slobodne	Stoji: postiže čučanj, ruke slobodne
64. STD: picks up object from floor, arms free, returns to stand	Stojeći položaj: uzima predmet s poda, vraća se u stojeći položaj bez podupiranja rukama	Stoji: uzima predmet s poda, uspravlja se, ruke slobodne
WALKING, RUNNING & JUMPING	HODANJE, TRČANJE I SKAKANJE	HODANJE, TRČANJE I SKAKANJE
65. STD, 2 HANDS ON LARGE BENCH: cruises 5 steps to R	Stojeći položaj, objema rukama se drži za veliku klupu: postranično hoda 5 koraka udesno	Stoji, objema rukama se drži za visoku klupu: hoda postranično 5 koraka udesno
66. STD, 2 HANDS ON LARGE BENCH: cruises 5 steps to L	Stojeći položaj, objema rukama se drži za veliku klupu: postranično hoda 5 koraka ulijevo	Stoji, objema rukama se drži za visoku klupu: hoda postranično 5 koraka ulijevo
67. STD, 2 HANDS HELD: walks forward 10 steps	Stojeći položaj, terapeut pridržava za obje ruke: hoda unaprijed 10 koraka	Stoji, pridržava se s 2 ruke: hoda prema naprijed 10 koraka
68. STD, 1 HAND HELD: walks forward 10 steps	Stojeći položaj, terapeut pridržava za jednu ruku: hoda unaprijed 10 koraka	Stoji, pridržava se 1 rukom: hoda prema naprijed 10 koraka
69. STD: walks forward 10 steps	Stojeći položaj: hoda unaprijed 10 koraka	Stoji: hoda prema naprijed 10 koraka
70. STD: walks forward 10 steps, stops, turns 180°, returns	Stojeći položaj: hoda unaprijed 10 koraka, staje, okreće se za 180°, vraća se u početnu poziciju	Stoji: hoda prema naprijed 10 koraka, zaustavlja se, okreće se za 180°, vraća se nazad
71. STD: walks backward 10 steps	Stojeći položaj: hoda unatrag 10 koraka	Stoji: hoda unazad 10 koraka
72. STD: walks forward 10 steps, carrying a large object with 2 hands	Stojeći položaj: hoda unaprijed 10 koraka, nosi veliki predmet objema rukama	Stoji: hoda prema naprijed 10 koraka noseći veliki predmet objema rukama

TABLE 2. Continued

English (original)	Croatian – prefinal version	Croatian – final version
73. STD: walks forward 10 consecutive steps between parallel lines 20 cm (8") apart	Stojeći položaj: hoda unaprijed 10 uzastopnih koraka između dviju paralelnih linija udaljenih 20 cm	Stoji: hoda prema naprijed 10 uzastopnih koraka između dviju paralelnih linija udaljenih 20 cm
74. STD: walks forward 10 consecutive steps on a straight line 2cm (3/4") wide	Stojeći položaj: hoda unaprijed 10 uzastopnih koraka na ravnoj liniji širine 2 cm	Stoji: hoda prema naprijed 10 uzastopnih koraka na ravnoj liniji širine 2 cm
75. STD: steps over stick at knee level, R foot leading	Stojeći položaj: prekoračuje štap postavljen u visini koljena, započinje desnom nogom	Stoji: prekoračuje štap postavljen u visini koljena, započinje desnom nogom
76. STD: steps over stick at knee level, L foot leading	Stojeći položaj: prekoračuje štap postavljen u visini koljena, započinje lijevom nogom	Stoji: prekoračuje štap postavljen u visini koljena, započinje lijevom nogom
77. STD: runs 4.5m (15'), stops & returns	Stojeći položaj: trči 4.5m, zaustavlja se i vraća u početnu poziciju	Stoji: trči 4.5m, zaustavlja se i vraća nazad
78. STD: kicks ball with R foot	Stojeći položaj: udara loptu desnom nogom	Stoji: udara loptu desnom nogom
79. STD: kicks ball with L foot	Stojeći položaj: udara loptu lijevom nogom	Stoji: udara loptu lijevom nogom
80. STD: jumps 30cm (12") high, both feet simultaneously	Stojeći položaj: skače 30 cm u vis, s oba stopala istovremeno	Stoji: skače 30 cm u vis, s oba stopala istovremeno
81. STD: jumps forward 30cm (12"), both feet simultaneously	Stojeći položaj: skače unaprijed 30 cm, s oba stopala istovremeno	Stoji: skače prema naprijed 30 cm, s oba stopala istovremeno
82. STD ON R FOOT: hops on R foot 10 times within a 60 cm (24") circle	Stojeći položaj na desnoj nozi: poskakuje na desnom stopalu 10 puta unutar koluta širine 60 cm	Stoji na desnoj nozi: poskakuje na desnom stopalu 10 puta unutar kruga širine 60 cm
83. STD ON L FOOT: hops on R foot 10 times within a 60 cm (24") circle	Stojeći položaj na lijevoj nozi: poskakuje na lijevom stopalu 10 puta unutar koluta širine 60 cm	Stoji na lijevoj nozi: poskakuje na lijevom stopalu 10 puta unutar kruga širine 60 cm
84. STD, HOLDING 1 RAIL: walks up 4 steps, holding 1 rail, alternating feet	Stojeći položaj, pridržava se za jedan rukohvat: penje se uz 4 stepenice izmjeničnim hodom, pridržava se za jedan rukohvat	Stoji, pridržava se za 1 rukohvat: penje se uz 4 stepenice izmjeničnim hodom, pridržava se za 1 rukohvat
85. STD, HOLDING 1 RAIL: walks down 4 steps, holding 1 rail, alternating feet	Stojeći položaj, pridržava se za jedan rukohvat: spušta se niz 4 stepenice izmjeničnim hodom, pridržava se za jedan rukohvat	Stoji, pridržava se za 1 rukohvat: spušta se niz 4 stepenice izmjeničnim hodom, pridržava se za 1 rukohvat
86. STD: walks up 4 steps, alternating feet	Stojeći položaj: penje se uz 4 stepenice izmjeničnim hodom	Stoji: penje se uz 4 stepenice izmjeničnim hodom
87. STD: walks down 4 steps, alternating feet	Stojeći položaj: spušta se niz 4 stepenice izmjeničnim hodom	Stoji: spušta se niz 4 stepenice izmjeničnim hodom
88. STD ON 15cm (6") STEP: jumps off, both feet simultaneously	Stojeći položaj na stepenici visokoj 15cm: skače prema dolje, s oba stopala istovremeno	Stoji na stepenici visokoj 15 cm: s oba stopala istovremeno skače prema dolje

sample of seven participants. The aim of the research was to translate and culturally adapt the GMFM-88 instrument into Croatian in order to enable therapists in Croatia to use and conduct the test in their own language.

When translating items to Croatian, it was of great importance that the authors HG and DH who made the "forward" translation actively used the GMFM-88 test, knew the cultural specifics of Croatian and were familiar with the goals of the research in detail. It was also an advantage that the third author, MNP, is bilingual and fluently speaks both English and Croatian. Another point of great significance to the success of the research was the involvement of the author of the GMFM-88 test herself, *Dr. Dianne Russell*, who revised and participated in the "backward" translation. The advantages of the research are the participation of respondents

who are proficient in their field of work and actively work with children with developmental disabilities. One more advantage is also the participation of the respondents who have not yet used the questionnaire in their daily work, since it was they who pointed out to us certain ambiguities or omitted words that were unintentionally omitted. The fact that the subjects had not previously used the questionnaire allowed them to study meaning and order of the words more closely and in more detail as to understand the item. It resulted in their comments and suggestions contributing greatly to the final version of the translation.

During the analysis of the results of the research, certain shortcomings were also noticed. One of the drawbacks of the survey is a small number of subjects. Since we sought the subjects in partnership with the Academy of Develop-

mental Rehabilitation by asking for access to the list of participants who participated in professional training on the GMFCS classification system and the GMFM-88 test in Croatia and through Facebook groups whose members are therapists, medical doctors and rehabilitators, interest to participate in the research was small and no respondents participated in the research through social media advertising. Although the invitation email was sent to 68 e-mail addresses, only seven respondents completed their participation in the survey.

Further steps for complete adaptation of the GMFM-88 measure into Croatian would be the standardization of the instrument and the verification of the psychometric characteristics of the measuring instrument in Croatian: validity, reliability, sensitivity, and standardization on the sample of children with cerebral palsy and Down syndrome in Croatia. Only after examining of these characteristics, GMFM-88 in Croatian will be fully psychometrically adapted for use for research and clinical purposes. Although the psychometric characteristics of GMFM-88 have not yet been investigated, the translation and adaptation of this comprehensive and high-quality test in Croatian conducted as part of this research is an indispensable contribution to the complete adaptation of the test in Croatia.

In conclusion, the aim of this study was to translate and adapt the GMFM-88 test to Croatian. For the translation and adaptation, we used the first five modified steps of the *Sousa and Rojjanasrirat* (2010) guidelines: "forward" translation, translation comparison, backward translation, backward translation check, translation verification with the author of the original GMFM test and testing the pre-final version of the translated GMFM-88 test. Seven participants with whom qualitative interviews were conducted participated in the study and 72 out of 88 items were changed according to their advice and additions. The translation and adaptation of the test into Croatian was the first and big step towards validation and use of the translated GMFM-88 test in Croatia.

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SAŽETAK

Prijevod i prilagodba Procjene grubih motoričkih funkcija – 88 na hrvatski jezik

Dunja Husnjak, Hrvoje Gudlin, Monika Novak-Pavlic

Instrument za procjenu grubih motoričkih funkcija (eng. Gross Motor Function Measure-88 – GMFM-88) standardizirani je opservacijski instrument za procjenu grubih motoričkih funkcija za djecu s cerebralnom paralizom i Downovim sindromom. Kliničari u Hrvatskoj pokazuju sve veći interes za korištenje GMFM-88 testa. No, do sada je bila dostupna samo engleska verzija instrumenta, koja je otežavala njegovu primjenu u Hrvatskoj. Cilj ovog istraživanja bio je prevesti GMFM-88 bodovni list s engleskog na hrvatski jezik i prilagoditi ga za primjenu u kliničkoj praksi. U ovom istraživanju slijedili smo prvih pet koraka smjernica Sousa i Rojjanasrirat (2010.) za prijevod i prilagodbu GMFM-88 bodovnog lista. Prvo, dva autora neovisno su napravila "forward" prijevod; prijevod bodovnog lista s engleskog na hrvatski jezik. Zatim je treći autor napravio "backward" prijevod, koji je provjeren i revidiran od strane autora GMFM-88 testa. Predfinalna verzija prevedenog instrumenta testirana je kroz tzv. "cognitive debriefing" sa sedam kliničara. Ispitanici su ukazali na važnost dosljedne upotrebe određenih riječi te su iznijeli prijedloge za poboljšanje, poput promjene redoslijeda riječi ili skraćanja prevedenih čestica. Promijenjene su 72 od 88 čestica. Ovim istraživanjem započeta je prilagodba GMFM-88 na hrvatski jezik. Sljedeći korak do potpuno validiranog GMFM-88 testa na hrvatskom jeziku je psihometrijsko testiranje djece s cerebralnom paralizom i Downovim sindromom u Hrvatskoj.

Ključne riječi: PRILAGODBA; CEREBRALNA PARALIZA; DOWN SINDROM; PRIJEVOD