Preface

Like so many students I, Dyoni Roosen, had to write a master thesis in order to obtain my diploma of physiotherapist. However, writing a master thesis has its ups and downs. Unfortunately, not everything goes as smooth as we want. So there where a few obstructions, some even bigger as expected, during the road towards the final result. Therefore, I am pleased, that after 2.5 years of hard work, I can present you this master thesis.

At first I would thank my promoter Prof. Dr. Annick Timmermans for her support and help during the development of this thesis. She was a lifeline when I had difficulties in the beginning and she gave me the opportunity to start over with an all new literature study. In addition she gave me the opportunity to continue an already existing research so I would not waste time with the development of a new research protocol. This made it possible for me to graduate in February. She stood beside me with help and advice and was always helpful with correcting and adjusting the literature study or the research. Without her, this work would never been realized.

Beside Prof. Timmermans I would also thank PhD student Ruth Spierings for her help during the final research months. I also want to thank profusely the previous thesis students Bert Cuyvers and Jonas Verbrugghe for handing me their research results and for the use of their research.

I also want to thank the Department of Physical Medicine and Rehabilitation at Jessa Hospital, Hasselt. As well as the Head of the departement, Dr. G. Claes and the head of the paramedical team mr. E. Olivieri who offered me the opportunity to use their facilities and offered their full cooperation. But especially my thanks go to Stefanie Vanbrabant and Bart Creemers, and all the other therapist. They have ensured the best possible recruitment of patients as well as their cooperation in informing and including the patients. Also I want to thank extensively all the patients who participated in this study, without them it wasn't possible to complete this thesis.

Finally I want to thank the university of Hasselt and all the professors for giving me the opportunity, utilities and knowledge to complete my master studies. And I hopefully become an excellent physiotherapist.

Bree 01/01/2015   D.R.

Situating the research

Background

Musculoskeletal disorders (MSDs) are the most prevalent causes of chronical diseases[1-4]. Around 35% of the population in industrialized countries suffers from problems of musculoskeletal nature[5-7]. These MSDs have a major impact on the life of the patient and his/her functionality, but they also provide a heavy burden on the global health systems [2,4,8] Not only are these MSDs frequent, but the prevalence will increase, partly due to an aging population[3,8-10]. Related to the prevalence the impact of these conditions on the individual and the pressure on the health systems will continue to increase during the next decades [2,5,8]. Client-centered therapy could improve the motivation and compliance of patients with MSD's. To apply this form of therapy we need to expand the knowledge on training preferences of patients[11]. Technology could improve this client-centered therapy. The therapist would be able to work more individually, give specific guidance, improved feedback and intervene much easier and faster in a rehabilitation process, which are the most important aspects of client-centered therapy[12]. In this context it would be necessary to know how accustomed patients are with technologies and which are the activities patients would prefer to train on.

Research Context

This study aims to expand the knowledge of the patient's preferences and motivating factors during a rehabilitation for neck pain. In addition, this study hopes to expand the views of the same patients on the use of technology. Thus, future rehabilitation could improve and therapists can work more on the individual needs of the patient and approach their specific problems even better. The information on technology use is also necessary to develop technology assisted rehabilitation.

Research Framework

A literature study from B. Cuyvers and J. Verbrughe was excecuted in 2013[13]. The results of this literature study were used to compose questionnaires, which were used in the experimental study. The study itself started in 2012 as a new research. The design and protocol were set up by Bert Cuyvers & Jonas Verbrugghe under supervision of Prof. Dr. Timmermans[13]. After their graduation in 2014, the study was continued by D. Roosen in the context of his master thesis. B. Cuyvers, J. Verbrughe and D. Roosen performed the first part of patient recruitment, data collection and data analysis of patients. B. Cuyvers and J. Verbrughe did this in the period from September 2013 till May 2014 and D. Roosen in the period from July 2014 till January 2015. The students were responsible for the interviews with the included patients and for the communication with the therapists working in the rehabilitation program. The communication was done through Stefanie Vabrabant and Bart Creemers, they gave information on the schedules of possible candidates. Facilitation of the research management was discussed with E.Olivieri (head of the paramedical department). Communication with the participants was done by e-mail and follow up interviews. This thesis is written entirely by D. Roosen with systematic adjustments by PhD student Ruth Spierings and supervision of Prof. Dr. Timmermans. During the research the students also inventoried data on motivation and compliance that will be used in future research but will not be reported in this thesis.

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Patient-centered rehabilitation in neck pain: Do training preferences of patients change during a 2 month rehabilitation period?

Abstract

Aim: The aim of this research is to investigate if training preferences change during a neck rehabilitation program of 2 months. The first goal of this study is to identify de training preferences of these patient. A second goal is to evaluate if there is a difference after 2 months. The third goal is to identify/inventory the technological abilities of the patients.

Methods: Semi-structured interviews were obtained based on the Neck Disability Index (NDI) at the start of the rehabilitation and after 2 months.

Results: Thirty-four patients with neck pain (12 male/22 female; NDI=17.32, SD=5.803) have been included in this study. The average age of participants was 42.85 years (SD=12.534). These participants indicated that their most preferred training activities were: sitting posture, lifting and driving a car. The motives behind this specific preferences were work and/or study and sitting posture. Sport and recreation was the most chosen motive but did not correspond to a top three preference. After eight weeks of rehabilitation participants still have the same training preferences and motives to rehabilitate. Participants are accustomed with the proposed technologies. A mobile phone/smartphone, computer/laptop and tablet are devices that are used at least on a weekly basis. The purpose of this electronic devices is more personal use than work purposes. PC/laptop and tablets are used for a wide variety of tasks such as mobile phones and smartphones but these are especially used for communication.

Conclusions: Patients with neck pain prefer to train on functional activities that are frequently used during the day such as working activities like prolonged sitting, driving a car and lifting objects. These preferred activities do not change after eight weeks of rehabilitation. Also patients are accustomed to the use of technologies which support the statement to use these tools in future rehabilitation.

Keywords: Client-centered, neck pain, training preferences, rehabilitation

Introduction

During the 20st century diseases or conditions with deadly consequences were the most common health problems [14]. In the current era, the so-called compensatory conditions like neck and back pain are the most common, as found in the preliminary literature study of last year[12].Throughout a lifetime, on average 46.2% of the people will undergo a period of neck pain [14-17] and 29.7% of the people will develop neck pain during a year [14,16-20]. Not only is neck pain a common condition, it has an major impact on the daily functioning of an individual [2,5,6,14,21-24]. Compared to the past century, neck pain increased from 23.9 million disability adjusted life years in 1990 to 33.6 million disability adjusted life years in 2010[25].

Neck problems are the most common in developed regions like Europe or Northern America [16,17,20,25]. In addition, a whole section of psychosocial, economic, financial and work-related factors are involved in the development of neck pain [16,20,26-29]. The use of technology can play a major role in rehabilitation programs and may thereby enhance the treatment of people with neck pain. The therapist could communicate faster with the patient and would be able to follow the patients home exercises and progress. If it's necessary the therapist could intervene by using this technology.

It has been proven that conducting in a rehabilitation program with the emphasis on stretching techniques and exercise therapy of the neck and shoulder muscles has an positive effect on neck pain, physical capacity, a better posture and less functional disabilities in the daily life[30-32].

Client centered therapy is a form of therapy that could improve the rehabilitation of patients. This therapy has already proven to positively influence the rehabilitation outcome of patients with neurological disorders [33-38]. In the preliminary literature study [12], eleven studies were found. There were studies who examined the effect of client-centered therapy on back pain, sports injuries, musculoskeletal problems of the upper and lower extremities, rheumatoid arthritis, prevention of musculoskeletal problems and a rehabilitation program for elderly [12]. Despite this broad range of conditions, the positive effect of client-centered therapy could only be proven for back pain and sports injuries [12].

There are three different types of client-centered therapy. These can exist alone or the therapy could combine multiple types: a) the patient may define the treatment or therapy in consultation with the therapist or not, and/or b) the patient may define his or her own treatment goals and/or c) the patient receives intensive and/or individual guidance. These individual guidance can exist of extra feedback, individual education about their pathology and/or extra motivation, with or without technological support [11,36,39-41]. At the moment client-centered therapy is most commonly used in the second type: the patient may define his/her own treatment goals [12] and determines his/her own training preferences.

A quick summary indicates that a client-centered approach is a form of therapy in which the patients' needs are placed centrally, not the patient's disease. It is this influence that provides a good motivation and is a good predictor of treatment compliance and treatment outcome [11]. Working on individual training preferences which lean towards the needs of daily life increases the motivation to rehabilitate as well as the concentration, self-reliance, and compliance [21,41].

The use of technology can contribute to a client-centered approach. It would be able to work more individually, give specific guidance, improved feedback and intervene much easier and faster in a rehabilitation process.

Although there exist general recommendations for training preferences, no guidelines are clearly established yet [21]. Also, whether or not these preferences change during the rehabilitation process is important to determine an individual approach, especially in the case of technology supported rehabilitation where training goals cannot always be discussed with a therapist. Before client-centered therapy and the use of technology can be applied, it is important to know which are the most preferred training preferences and how the therapist can communicate the easiest way with people through this technology. It is important to identify the training preferences to incorporate a client-centered approach into the rehabilitation process.

This study aims 1) to identify training preferences and life roles for rehabilitation in patients with neck pain, 2) to investigate to which extent training preferences and or life roles change during a two month rehabilitation period, and 3) to identify/inventory the technological abilities of the patients.

Materials and methods

Aim of the study

This study aims 1) to identify training preferences and life roles for rehabilitation in patients with neck pain, 2) to investigate to which extent training preferences change during a two month rehabilitation period, and 3) to identify/inventory the technological abilities of the patients.

Research questions

At the beginning of this study four research questions were drawn:

1. What are the training preferences of patients with neck pain who participate in a neck rehabilitation program?

2. To which "life roles" do the training preferences in a rehabilitation program for patients with neck pain pertain?

3. Do these training preferences change during the rehabilitation?

4. What are the technologies that are used by patients with neck pain?

Hypotheses

At the beginning of this study (first part) three hypotheses were formed:

1. Patients with neck pain prefer to train on specific functional activities within their rehabilitation program.

2. Patients have specific life roles to relate to specific functional activities on which they want to train within their rehabilitation program.

3. Patients are accustomed to using electronic devices that could also be used for support in rehabilitation settings.

During the second part of the study two extra hypotheses were formed:

4. The preferences of patients with neck pain change after eight weeks of rehabilitation because the needs of the patients change due to improvement of functions.

5. The life roles of patients with neck pain change after eight weeks of rehabilitation because the needs of the patients change due to improvement of functions.

Study Design

This study was an exploratory cohort research which used a prospective longitudinal study design. The study has a medical ethics approval, which was obtained from the medical ethical committee of Jessa Hospital (Hasselt,Belgium) and Hasselt University (Hasselt, Belgium).

Subjects

Recruitment

This study aimed to identify 40 participants (n=40), 19 of them were recruited in a first part that was conducted last academic year 2013-2014 by Bert Cuyvers and Jonas Verbrughe. The other participants were recruited during the period July 2014 - January 2014. All the subjects were recruited from the Department of Physical Medicine and Rehabilitation at the Jessa hospital in Hasselt, Belgium. This department is led by Dr. G. Claes as head of the department and by E. Olivieri as head of the paramedical service. Information of new possible participants was obtained by contacting the department. When interested, the participants were screened for in- and exclusion criteria and asked to sign the informed consent.

In- and exclusion criteria

Participants in the study were subjected to the following inclusion criteria: a) patients with neck pain, b) patients must be older than 18 year, c) patients cannot any orthopedic problems at the upper limb. Exclusion criteria were: any comorbidity that could influence the motivational status of the patient e.g. depression (this must be medically diagnosed).

Procedure

The duration of this study was eight weeks and started at the beginning of the rehabilitation program of the included patients. At the start the questions on patients characteristics and the semi-structured interview about the training preferences and life roles were conducted. The semi-structured interview was repeated after eight weeks of rehabilitation. Weekly the participants received an e-mail with questions on motivation and treatment compliance. For the participants without the opportunity to use an e-mail account, paper versions of the weekly questions were available.

Rehabilitation program

Participants of this study followed the RECO program at the department of Physical Medicine and Rehabilitation. This program consists of a 12-16 weeks of rehabilitation which was prepared by one of the therapists of the Jessa Hospital in Hasselt. The participants underwent, a training session of two hours two times a week. In these two hours the participants received standard exercise therapy with emphasis on functional retraining of the neck and shoulder region. The participants also need to follow at least one educational course of back school. Depending on the patients' needs, they received manual therapy (e.g. mobilizations, traction, …). In the program an active posture training was applied during individual training sessions. During the program the patients received home exercises and were encouraged to perform these on a daily base for at least 20-30 minutes a day.

Measurements

The communication between participants and researcher was done by a standard e-mail which was sent every Saturday morning. For this purpose there was a specific account which was set up by the researches of last year [13]. During the study there were three primary measurements (Neck disability index (NDI), training preferences and technology questionnaire (appendix 3)). Two of them were used in both the interviews and the technology questionnaire was only obtained in the first interview. The implementation of the measurements during the study are presented in table 1.

Primary measurements

Neck Disability Index

The NDI was conducted during the first interview and after eight weeks of follow up. The NDI has a test-retest reliability of 0.89[10,42]. The validity was 0.60 for mapping the inability of performing the daily activities that are most affected by neck problems[10,42] . A Dutch version was available and used for this study[1]. This version consisted of ten categories respectively pain, personal care, lifting, reading, headache, concentration, work, driving a car, sleeping and spare time. The participants needed to score each category with the statement that was the most accurate for them. Each statement corresponded with a score from zero to five. Whereby zero stands for no problems at all and five stands for not even possible due to the pain. After the NDI was completed these scores were added together and a total NDI score was formed. The higher the score the more a person is limited by his neck disorder.

Training preferences and life roles

At the start of the rehabilitation program, a semi-structured interview and multiple questionnaires were used to identify training preferences and descriptive data of participants (such as age, sex, specific diagnosis of the pathology, time since first neck pain, history of rehabilitation, occupation, education, etc.). For the identification of these preferences a methodology was used similar to Timmermans et al. [43]. The interview was based on activities mentioned in the NDI (appendix 1). Beside the NDI, participants were asked to add five extra activities on which they want to improve during their rehabilitation. Every participant needed to organize his composed list of preferences in order of importance, on a scale from one to five (five = most preferred activity, one = least preferred activity). In addition, each of the participants was asked in which life roles they situated each one of the five activities they wished to improve. As life roles we see the motives of the patients to train a specific activity. Like hobby or as parent to be able to take care of their child, or maybe as friend to help each other or to regain a social life.

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[1] See appendix 1

Questions concerning technology use:

For the research on technology use (EDM: questionnaire about technology[2]), three main questions were asked. Patients had to answer these during the first interview. First, the frequency of use was questioned, secondly the reasons for use, personal or work related, and finally, for which cause they use it.

Table 1: Implementation of measurements

	Point of time	**Information**	**Description**
T-0	**At the start of the treatment**	**Characteristics and baseline measurements**	▪ **Neck disability** ▪ **5 Training preferences and life roles** ▪ **Questions on technology use**
T-1	**During the treatment for 8 weeks, every week.**	**Motivation and compliance score**	▪ **VAS for motivation per training session** ▪ **Compliance**
T-2	**After 8 weeks**	**Comparison measurements and motivational factors[3]**	▪ **Neck disability** ▪ **5 Training preferences and life roles** ▪ **Motivation questions** ▪ **Non-compliance questions (T3)[4]**

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[2] See appendix three
[3] List depends on decrease of motivation or remained motivation
[4] T-3 was only conducted if the participants missed a training session

Data analyses

Training preferences and life roles were analyzed trough open coding. SPSS statistics and Microsoft Office Excel were used analyze the patients training preference scores and life role scores. Descriptive analyses were performed through SPSS for the following data: gender, age, diagnose time, education and NDI score. After receiving all the data of the participants, a complete list with all the preferences mentioned by the participants was composed. For each preference a total score (= overall preference score) was computed by summing up all scores of that preference. The overall preference scores were arranged in descending order. Also there was a list formed with all the life roles mentioned by the participants. This list was based on the same characteristics as the method used to identify the training preferences (scores one to five were given to mentioned life roles and a list with overall occurrence of life roles was created to achieve a overall life role score).

Time planning

The implementation of this study started from the moment the first participants were recruited and available for the start and execution of the RECO program. The recruitment happened in two parts. The first part was in the academic year of 2013-2014. The second part in the academic year of 2014-2015. The recruitment of participants and the data collection from the first part ran from September 2013 until May 2014. The recruitment and data collection of the second part ran from July 2014 until January 2015. The statistical analyses and data extraction were carried out upward of the end of the treatment program and ran until the end of January 2015. The presentation of the study was due the 10th February 2015.

Results

Participants

The goal of the study was to obtain 40 participants, but only 34 participants were recruited during the two parts of recruitment. Patient characteristics are presented in table 2. The presented results are from interviews of 34 patients (12 males and 22 females). At baseline the average age was 42.85 (±SD 12.354) and average NDI score was 17.32 (±SD 5.803). During the study twelve drop outs. Three participants dropped out of the study during the second leg. The reason for two quitting the rehab program was: 'no more pain'. A third one indicated he was not interested in the study anymore. The other nine drop outs were from the first part, no reasons for quitting the program and/or study were obtained. So after two years a total of twenty-two participants (8 males and 16 females) with an average age of 42.48 (±SD 10.461) and an average NDI score of 16.40 (±SD 6.311) remained.

Table 2: Patients characteristics

Characteristics		Total (n=34)
Gender		
	Male	12
	Female	22
Diagnose time		
	Acute	2
	Subacute	23
	Chronic	9
Age		
	Average	42.85
	SD	12.354
	Total range	18-71
Education		
	Elementary	2
	Secondary	21
	Higher education	9
	University	2
NDI		
	Average	17,32
	SD	5.803
	Total range	6-29

Skill training preferences at the start of the rehabilitation

After analyzing the data the training preferences were arranged in seven different categories which are presented in the table below. The most chosen category for training preferences is sport and recreation (table 5). A top ten of training preferences is presented in table 3[5]. The results show that the most preferred training preference is sitting posture. Participants mostly indicated that this was a major dysfunction and wanted to improve this. Lifting and driving a car were close second and third preferred activities.

Motives for choosing preferred training skills at the start of the rehabilitation

After the baseline interviews a list of 10 life roles mentioned by patients for choosing a training preferences was composed. This list is presented in table 4. The most chosen motive for training a specific skill was work or study related. Personal health, hobby and recreation, parenthood and partnership completed the top five.

Skill training preferences after eight weeks of rehabilitation

After eight weeks of following the program there were no differences found in categories (see table 5). Sport and recreation remained the top chosen category of training preferences. There was only a little difference in the top ten training preferences. At baseline sitting posture was the number one training preference. After eight weeks it was dropped to the second place and driving a car topped the list as most preferred training preference. Lifting for work purposes was replaced by lifting for household purposes. A top ten list is presented in table 3.[6]

Motives for choosing preferred training skills after eight weeks of rehabilitation

A bigger difference is found in the motives given by the participants. After eight weeks the top ten is reorganized, as presented in table 4. Only the number one stays the same. Work or study is the most chosen life role by participants. The rest of the top five is completed by hobby and recreation, personal health, household and partnership. This ensures that the top five is still the same as before the treatment, only household replaces parenthood and the ranking is a little bit different.

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[5] A total list of training preferences is presented in appendix 7.
[6] A total list of training preferences is presented in appendix 8.

Table 3: Training preferences at baseline (T1) and after eight weeks (T2)

T1 (n= 34)	Training preferences (category)	TPS	T2 (n=22)	Trainingspreferences (category)	TPS
1	Sitting posture (Sitting posture)	48	1	Driving a car (Car/motor driving)	35
2	Lifting (Work/study	47	2	Sitting posture (Posture)	32
3	Car driving (car driving)	45	3	Lifting (Household)	24
4	Running/walking (Sport and recreation)	36	4	Lifting (Work/study)	20
5	hair care (Personal care)	25	5	Riding a bike (Sport and recreation)	19
6	Reading (Sport and recreation)	20	6	Doing labor (Work/study)	16
7	Riding a bike (Sport and recreation)	20	7	Prolonged standing (Work/study)	15
8	Household (Household)	16	8	Houshold (Household)	13
9	Watching television (Sport and recreation)	14	9	Walking (Sport and recreation)	12
10	Prolonged standing (Work/study)	14	10	Lifting children (Household)	10

Table 4: Motives for training preferences at baseline (T1) and after eight weeks (T2)

Liferoles as named by the patient (T1 n=34)	Total group rank (tls[7])	Liferoles as named by the patient (T2 n=22)	Total group rank (tls)
Work/study	1 (156)	Work/study	1 (128)
Personal health	2 (91)	Hobby and recreation	2 (75)
Hobby and recreation	3 (83)	Personal health	3 (58)
Parenthood	4 (63)	Household	4 (20)
Partnership	5 (52)	Partnership	5 (14)
Household	6 (48)	Family	6 (10)
Social	7 (18)	Social	7 (5)
Family	8 (13)	Grandparent	8 (5)
Caregiver	9 (7)	Parenthood	9 (4)
Grandparent	10 (2)	Caregiver	10 (0)

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[7] Tls: Total liferole score

Table 5: Categories of training preferences at baseline (T1) and after eight weeks (T2)

T1 (n=22)	Category	TPS[8] per cat	T2 (n=22)	Category	TPS per cat
1	Sport and recreation	141	1	Sport and recreation	112
2	Household	118	2	Household	72
3	Work/study	93	3	Work/study	70
4	Car/motor driving	61	4	Car/motor driving	40
5	Sitting posture	48	5	Sitting posture	33
6	Personal care	48	6	Personal care	11
7	Rehabilitation	11	7	Rehabilitation	2

Technology use of patients

In the tables 6, 7 and 8, the results of the questions on the use of technology tools are presented for the thirty-four participants at baseline. In table 9 the results show that thirty-two participants use the computer or laptop (64.7% uses it on a daily bases). The tablet is used by 70.5% of the participants. Exactly 50% of the participants uses a smartphone and 76.5% uses a regular cellphone. All the participants used a smartphone or regular cellphone. A Mp3 player is only used by 35% of the participants and mostly seldom, only three participants use it on daily bases. All the devices mentioned in the questionnaire are mostly used for personal use rather than for work (table 10). For every device, there is a total ratio of 2:1 and more. In general, the devices are mostly used for communication and/or information (table 11). The Mp3 player is only used for listening music, except for one participant. PC/laptop and tablets are also used to play games, listen to music, watch a video and to visit social network sites.

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[8] TPS: total preference score

Table 6: 'How often do you use these devices?'

Question 1	Don't know it	Never	Seldom	Monthly	Weekly	Daily
a.Computer/laptop	0 (0%)	2 (5.8%)	1 (2.9%)	5 (14.7%)	4 (11.8%)	22 (64.7%)
b. Tablet	1 (2.9%)	9 (26.5%)	6 (17.6%)	2 (5.8%)	2 (5.8%)	14 (41.2%)
c. Smartphone	1 (2.9%)	16 (53.3%)	1 (2.9%)	1 (2.9%)	0 (0%)	15 (44.1%)
d. Phone	0 (0%)	8 (23.5%)	1 (2.9%)	1 (2.9%)	2 (5.8%)	22 (64.7%)
e. Mp3	1 (2.9%)	21 (61.8%)	6 (17.6%)	2 (5.8%)	1 (2.9%)	3 (8.8%)

Table 7: 'What do you use the devices for?'

Question 2	Personal	Work
a. Computer/laptop	30 (88,2%)	17 (50%)
b. Tablet	22 (64.7%)	6 (17.6%)
c. Smartphone	16 (53.3%)	8 (23.5%)
d. Phone	24 (70,5%)	10 (29,4%)
e. Mp3	15 (44.1%)	1 (2.9%)

Table 8: 'What kind of applications do you use on these devices?'

Question 3	Communication	information	Games	Music	Movies	Social network
a. Computer/laptop	24 (70.6%)	30 (88.2%)	8 (23.5%)	13 (38.2%)	12 (35.3%)	15 (44.1%)
b. Tablet	15 (44.1%)	15 (44.1%)	8 (23.5%)	7 (20.6%)	10 (29.4%)	10 (29.4%)
c. Smartphone	16 (47%)	12 (35.3%)	5 (14.7%)	7 (20.6%)	4 (11,8%)	8 (23.5%)
d. Phone	25 (73.5%)	5 (14.7%)	2 (5.8%)	5 (14.7%)	2 (5.8%)	6 (17.6%)
e. Mp3	1 (2.9%)	1 (2.9%)	1(2.9%)	14 (41.2%)	1 (2.9%)	1 (2.9%)

Discussion

Client-centered therapy [11] and technology supported rehabilitation are gaining interest. In order to create and develop technology supported client-centered rehabilitation programs, it is important to expand our knowledge of training preferences and motives for training so exercises that support these training preferences can be implemented in future technologies.

The first aim of the study was to identify training preferences and life roles of patients with neck pain. After analyzing the data it was found that participants most likely want to train on preferences related to sport and recreation, household and work. These categories scored the highest with the total preferences score. But in the top three of training preferences, it is seen that participants prefer to train specific on sitting posture, lifting for work purposes and driving a car. All of these activities are specific functional tasks we do every day. For example sitting posture: this activity is very common in our society because there are a lot of working people who need to sit for a prolonged time during their work[5]. It is not so surprising that the participants indicated they wanted to be able to sit for a prolonged period of time without experiencing pain. This also applies for lifting and driving a car. These are common daily functional tasks and correspond perfectly with the hypotheses drawn in this study. Based on these results, this study suggests that training on these activities could improve or make the rehabilitation more pleasant for patients with neck pain. Because they experiencing training of activities they want to improve The results of this study were similar to the findings of Timmermans et al. in 2009, in which inventoried inventory of the skill training preferences and related motives of sub-acute and chronic stroke patients. This research indicated that functional activities and tasks related to daily life activities were preferred by the participants. In patients with stroke however the results pertained more to the ability to regain self-care, while neck patients preferred to train on activities on participation level (e.g. being able to work again, being able to exercise, being able to go out with my partner) [26]. There was a small difference in the results between the first and second part of this study. During the first part executed by Cuyvers and Verbrughe, the top three of preferred training preferences were: Lifting objects, driving a car and sitting posture[13]. During this second part of this study these three preferences switched places. Sitting posture became the most preferred training preference, lifting objects the second and driving a car the third.

The second question in this first aim was to identify the motives corresponding to these training preferences. To report these motives a list with life roles was created. These results show that work or study is the most chosen life role followed by personal health and hobby and recreation. This indicates that people have a sort of drive to rehabilitate for work purposes, the reason why is not clear. It could be for financial motives or because people want to be good at their work, the same was found in the first leg [13]. The participants did not indicated if it was for these financial reasons or just achievement-oriented. Beside this, participants have also the need to be able to take care of themselves (personal health) and to keep participating in society during sport and recreational activities. It is important that the therapist asks the patients which activities they want to improve and why this activity is important for them. In this way, a client-centered therapy can be created by the therapist[11,44]. There is a big differences in population compared to previous research on training preferences performed by Timmermans et al. .So therefor no comparison of the results on the motives can be made. The stroke patients presented motives that were related to perform certain tasks in an acceptable way in their surroundings. Patients with neck pain do not have enough personal functional impairments to consider these tasks as problems. Patients with neck pain care more about participation levelled activities and want to be able to function as before the pain. Their live roles reflect these activities (e.g. being able to work on first place, secondly being able to take care of their personal health and thirdly being able to do their hobbies).

A second aim of this study was to identify any changes in these training preferences during the rehabilitation program. According to the results found in this study training preferences there are only small changes. The number one of the training preference is driving a car. This is followed by sitting posture and lifting for household purposes. Lifting for household purposes is the only real change after eight weeks. This replaces lifting for work purposes in the top three. This could indicate that participants first want to train on work related tasks because of the reasons mentioned above and after a while they want to expand their abilities, because they can handle more work. The only other change is that sitting posture is at second place instead of lifting for work purposes. The same is found for the motives behind the training preferences, there is no large difference in the top three of life roles given by patients. Work or study remains number one followed by hobby and recreation and personal health. So only personal health and hobby and recreation switch places. After eight weeks participants still want to train in order to improve at work. Also the need for participation in society remains the same. This could support technology-supported rehabilitation. There are no needs to provide other rehabilitation programs after eight weeks.

A third aim was to identify the most used technologies by the participants. As found in the study, and conformable with the hypotheses drawn, participants are very well accustomed with technology. The computer/laptop is used by almost every participant (94%) and 65% uses it on a daily base. Similar results are found for the rest of the devices, except for the Mp3-player, which was expected since other devices have the same function as a Mp3-player. This supports the possibility to use them in the rehabilitation. The smartphone is used by almost half of the participants, instead of a regular phone. This supports the possibility to use this device when sending information to patients in the future (e.g. emails, use of specific apps). According to the results, the computer/laptop is the most used device. This was expected due to the greatest variety in tasks comparing to the other devices. Unfortunately, in most cases, the computer is a stationary and fairly large device. So the use of this I mostly at home, which makes them less desirable than other devices like tablets or smartphones where the possibility exists to contact someone anywhere. These results indicate that the use of technology in the rehabilitation of patients with neck pain, would be possible. The possibilities vary hugely: the therapist could give reminders, motivational messages and feedback to the patients as well as asking questions quick and easy. In this way a positive contribution can be made to the adherence and compliance of patients.

Although the results are that training preferences and motives behind these preferences do not change during a during a rehabilitation program of eight weeks, some limitations of the study should be mentioned. First there were more female then males in the study. The ratio of included women was almost twice as high as men (12 men against 22 women). It is not clear if this had any effect on the results. According to previous research it appears that gender plays a role in the development of neck pain, it is proven that women have an higher risk to develop neck pain [2,14,15,18,20,25,45]. The ratio between men and women with neck pain is 1.5 to 1[27,29]. This differences would be due to a different physiological mechanism for pain perception according to LeResche[28,29]. LeResche also report that the willingness to report pain is greater in women than in men[27,28]. A more proven theory is that the level of estrogen is higher in women which causes higher pain levels[27]. It has also been proven that the effects of these rehabilitation programs are greater in women[32]. A fully proven theory is not available but LeResche suggest again that it's due to the willingness to rehabilitate[27,28].

Secondly the study used no further differentiation between chronic, acute and sub-acute neck patients. In future research it would be recommended to make a clear dissociation between these group of patients. Because the preferences could differ between the groups. A third possible bias of the study is found in the result on technology use. Not every participant understood that when you had a smartphone you did not have to indicate you had a cellphone. It is possible that people indicated they had a smartphone and a cellphone but in reality they only had a smartphone. It is recommended to future research that they make a clear difference in the questionnaire.

Fourthly a number of patients indicated sleeping (posture) as a training preference. However, this is not considered by physiotherapists as a trainable activity. Since this problem was discovered in the first part of the research, this activity was not accepted as a training preference in during the second part. Some participant, which mentioned sleeping as a preference, of the first part were asked to change their training preference. Unfortunately, it was not possible to ask every participant, therefore some participants have only four training preferences instead of five. It is recommended for future research to examine if the motivation fluctuates during a rehabilitation program and examine if there is a correlation of motivation and rehabilitation outcome with adherence.

Conclusion

Patients with neck pain prefer to train on functional activities that are frequently used during daily life activities such as prolonged sitting, driving a car and lifting. These preferred do not change after eight weeks of rehabilitation. The patients are accustomed to the use of technologies very well, both in work and personal setting, which paves the way for the use of these devices in future rehabilitation.

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Appendix 1: Neck Disability Index

Duidt aan welke uitspraak het beste overeenkomt met uw toestand:		
1. Pijn	Ik heb nu geen pijn	
	Ik heb nu weinig pijn	
	Ik heb nu matige pijn	
	Ik heb nu vrij hevige pijn	
	Ik heb nu zeer hevige pijn	
	Ik heb nu de slechts denkbare pijn	
2. Persoonlijke verzorging (wassen, aan- en uitkleden)	Ik kan goed voor mezelf zorgen zonder dat de pijn toeneemt	
	Ik kan goed voor mezelf zorgen hoewel dat de pijn doet toenemen	
	Voor mezelf zorgen is pijnlijk en gaat langzaam en voorzichtig	
	Voor mezelf zorgen lukt goed, maar vaak met enige hulp	
	Elke dag voor mezelf zorgen lukt meestal alleen met hulp	
	Ik kan mezelf niet aankleden; mezelf wassen gaat moeilijk en ik blijf in bed	
3. Tillen	Ik kan een zwaar gewicht tillen zonder dat de pijn toeneemt	
	Ik kan een zwaar gewicht tillen, maar dat doet de pijn toenemen	
	De pijn weerhoudt mij van het optillen van een zwaar gewicht van de grond, maar zou dat wel kunnen wanneer dat gewicht hoger (bijv. op een tafel) gelegen is	
	De pijn weerhoudt mij ervan om zware dingen op te tillen, maar het lukt me wel om lichte tot middelzware gewichten te tillen als ze makkelijk geplaatst zijn	
	Ik kan alleen zeer lichte gewichten tillen	
	Ik kan helemaal niets tillen of dragen	
4. Lezen	Ik kan zoveel lezen als ik wil zonder pijn in mijn nek	
	Ik kan zoveel lezen als ik wil met weinig pijn in mijn nek	
	Ik kan zoveel lezen als ik wil met matige pijn in mijn nek	
	Ik kan niet zoveel lezen als ik zou willen vanwege de matige pijn in mij nek	
	Ik kan bijna niet meer lezen vanwege de hevige pijn in mijn nek	
	Ik kan helemaal niet meer lezen	
5. Hoofdpijn	Ik heb helemaal geen hoofdpijn	
	Ik heb af en toe lichte hoofdpijn	
	Ik heb af en toe matige hoofdpijn	
	Ik heb vaak matige hoofdpijn	
	Ik heb vaak hevige hoofdpijn	

	Ik heb bijna altijd hoofdpijn	
6. Concentratie	Ik kan mij goed concentreren zonder moeite wanneer ik dat wil	
	Ik kan mij goed concentreren met enige moeite wanneer ik dat wil	
	Het kost mij duidelijk moeite om te concentreren wanneer ik dat wil	
	Het kost mij veel moeite om te concentreren wanneer ik dat wil	
	Het kost mij zeer veel moeite om te concentreren wanneer ik dat wil	
	Ik kan mij helemaal niet concentreren	
7. Werk	Ik kan zoveel werk doen als ik wil	
	Ik kan alleen mijn gewone werk doen, maar niet meer	
	Ik kan het grootste deel van mijn werk doen, maar niet meer	
	Ik kan mijn gewone werk niet doen	
	Ik kan bijna geen enkel werk meer doen	
	Ik kan helemaal niet meer werken	
8. Autorijden	Ik kan autorijden zonder enige nekpijn	
	Ik kan autorijden zo lang als ik wil met weinig pijn in mijn nek	
	Ik kan aurorijden zo lang als ik wil met matige pijn in mijn nek	
	Ik kan niet autorijden zo lang als ik wil vanwege de matige pijn in mijn nek	
	Ik kan bijna niet meer autorijden vanwege de hevige pijn in mijn nek	
	Ik kan helemaal niet meer autorijden	
9. Slapen	Ik heb geen moeite met slapen	
	Mijn slaap is heel licht gestoord (minder dan 1 uur wakker)	
	Mijn slaap is licht gestoord (1 tot 2 uur wakker)	
	Mijn slaap is matig gestoord (2 tot 3 uur wakker)	
	Mijn slaap is fors gestoord (3 tot 5 uur wakker)	
	Mijn slaap is volledig gestoord (5 tot 7 uur wakker)	
10. Vrije tijd	Ik kan aan alle activiteiten meedoen zonder enige pijn in mijn nek	
	Ik kan aan alle activiteiten meedoen met enige pijn in mijn nek	
	Vanwege de pijn in mijn nek kan ik aan de meeste, maar niet alle, gebruikelijke activiteiten meedoen	
	Vanwege de pijn in mijn nek kan ik aan maar weinig gebruikelijke activiteiten meedoen	
	Vanwege de pijn in mijn nek kan ik nagenoeg aan geen activiteiten meedoen	
	Ik kan aan geen enkele activiteit meer meedoen	

Geef vijf extra activiteiten waarop u zou willen trainen:

#	5 belangrijkste activiteiten

Orden in bovenstaande tabel nu de vijf activiteiten in volgorde van belang, 5 zijnde de belangrijkste activiteit, 1 de minst belangrijke. In de ordening mogen de activiteiten uit de NDI ook meegeteld worden.

Levensrollen

Tot welke levensrollen behoren de vijf belangrijkste activiteiten?

- Ouderschap (ouder, grootouder)
- Zorgverlener (behoeftig, bijvoorbeeld een zieke ouder)
- Werk/studie
- Hobby's
- Echtgenoot/partner
- …

	Activiteit	Levensrol
1		
2		
3		
4		
5		

APPENDIX 2: IMI

Intrinsic Motivational Inventory

Hieronder vindt u een lijst met een aantal vragen over u motivatie voor bewegen.

Voor ieder van de volgende stellingen kunt u aangeven in hoeverre dit voor u geldt, gebruikmakend van de volgende schaal:

	1	2	3	4	5	6	7	

Geheel mee eens   Een beetje mee eens   Geheel mee oneens

Duidt in elke regel één cijfer aan:

Interesse/Plezier	Ik vind het erg leuk om beweegactiviteiten te doen.	1	2	3	4	5	6	7
	Ik beleef plezier aan het doen van beweegactiviteiten.	1	2	3	4	5	6	7
	Ik vind het saai is om beweegactiviteiten te doen. (R)	1	2	3	4	5	6	7
	Beweegactiviteiten boeien mij totaal niet. (R)	1	2	3	4	5	6	7
	Ik vind (het doen van) beweegactiviteiten interessant	1	2	3	4	5	6	7
	Het doen van beweegactiviteiten geeft me voldoening.	1	2	3	4	5	6	7
	Ik besef me bij het doen van beweegactiviteiten hoeveel ik ervan geniet	1	2	3	4	5	6	7
Waargenomen competentie	Ik denk dat ik goed ben in het uitvoeren van beweegactiviteiten.	1	2	3	4	5	6	7
	Ik denk dat ik beweegactiviteiten beter kan uitvoeren dan andere mensen van mijn leeftijd en geslacht.	1	2	3	4	5	6	7
	Ik verwacht dat als ik beweegactiviteiten oefen, ik het gevoel zal hebben dat ik er aardig goed in zal zijn.	1	2	3	4	5	6	7
	Ik ben over het algemeen tevreden over mijn prestaties bij beweegactiviteiten.	1	2	3	4	5	6	7
	Ik vind van mezelf dat ik aardig vaardig ben bij het uitvoeren van beweegactiviteiten.	1	2	3	4	5	6	7
	Ik ben niet zo goed in het uitvoeren van beweegactiviteiten.	1	2	3	4	5	6	7
Inzet/Belangrijkheid	Ik doe erg mijn best bij bewegen.	1	2	3	4	5	6	7
	Ik doe niet erg mijn best om beweegactiviteiten goed uit te voeren.	1	2	3	4	5	6	7
	Ik doe erg mijn best om beweegactiviteiten uit te voeren.	1	2	3	4	5	6	7
	Ik vind het belangrijk om beweegactiviteiten goed uit te voeren.	1	2	3	4	5	6	7
	Ik steek niet veel energie in bewegen. (R)	1	2	3	4	5	6	7
Waargenomen keuze	Ik geloof dat ik zelf kan kiezen welke beweegactiviteiten ik ga uitvoeren.	1	2	3	4	5	6	7
	Ik heb het gevoel dat het niet mijn eigen keuze is om beweegactiviteiten uit te voeren. (R)	1	2	3	4	5	6	7
	Ik heb het gevoel zelf geen keuze te hebben over mijn beweegactiviteiten. (R)	1	2	3	4	5	6	7
	Ik heb het gevoel dat bewegen een verplichting is. (R)	1	2	3	4	5	6	7
	Ik doe beweegactiviteiten omdat ik geen keuze heb. (R)	1	2	3	4	5	6	7
	Ik doe beweegactiviteiten omdat ik dat wil.	1	2	3	4	5	6	7
	Ik doe beweegactiviteiten omdat ik het moet. (R)	1	2	3	4	5	6	7
Waarde/Nut	Ik geloof dat beweegactiviteiten waardevol voor mij kunnen zijn.	1	2	3	4	5	6	7
	Het doen van beweegactiviteiten zijn waardevol voor mij, daarom ben ik bereid om het vol te houden.	1	2	3	4	5	6	7
	Ik vind bewegen belangrijk.	1	2	3	4	5	6	7
	Ik geloof dat bewegen voordelen oplevert voor mij.	1	2	3	4	5	6	7

APPENDIX 3: EDM: vragenlijst rond technologie

1. Hoe vaak maakt u gebruik van onderstaande toestellen?

	Ken ik niet	Nooit	Zelden	Enkele keren per maand	Enkele keren per week	Dagelijks
Computer / laptop						
Tablet						
Smartphone						
GSM						
MP3 speler / iPod						

Opmerkingen?

_____

_____

2. Voor welke doeleinden gebruikt u deze toestellen?

	Persoonlijk gebruik	Werk
Computer / laptop		
Tablet		
Smartphone		
GSM		
MP3 speler / iPod		

Opmerkingen?

_____

_____

3. Voor welk soort toepassingen gebruikt u deze toestellen?

	Communicatie (SMS, e-mail, chat, etc.)	Informatie opzoeken	Games / spelletjes spelen	Muziek beluisteren	Filmpjes bekijken	Sociale netwerk sites (bv. Twitter, Facebook)
Computer / laptop						
Tablet						
Smartphone						
GSM						
MP3 speler / iPod						

Opmerkingen? Andere toepassingen?

_____

_____

APPENDIX 4: motivationele factoren (bij daling motivatie)

U bent momenteel minder gemotiveerd. Welke reden kan u hiervoor aangeven? *Duidt aan welke uitspraken het beste overeenkomen met uw redenen en rangschik ze vervolgens naar belangrijkheid,* *waarbij nummer '1' het belangrijkste is:*			
1.	Ik heb liever een oefenprogramma in groep.		
2.	Ik heb twijfels bij de bekwaamheid van de ondersteunende therapeuten.		
3.	Ik denk dat ik meer baat heb bij een individueel aangepast oefenprogramma.		
4.	Ik krijg onvoldoende professioneel advies.		
5.	Ik voel me onder druk gezet door mijn eigen verwachtingen.		
6.	Ik ervaar geen plezier meer in het revalideren.		
7.	Revalidatie is voor mij geen prioriteit in mijn dagelijkse leven.		
8.	Ik heb niet het gevoel dat de oefeningen mij controle over mijn aandoening geven.		
9.	Ik denk niet dat mijn oefeningen de aandoening verbeteren.		
10.	Ik train niet graag in een revalidatiecentrum.		
11.	Ik voel mij zwak/ziek.		
12.	Ik heb het gevoel beperkt te zijn door mijn leeftijd bij het volgen van het programma.		
13.	De revalidatie voldeed niet aan mijn initiële verwachtingen, omdat:		
14.	Ik ben van mening dat beweging/oefentherapie/revalidatie mijn aandoening niet zal verbeteren.		
15.	Ik kan revalidatie niet inplannen in mijn dagelijkse leven.		
16.	Mijn doelstellingen voor de revalidatie zijn al bereikt.		
17.	Ik voel mij onvoldoende ondersteund door de sociale omgeving tijdens de revalidatie.		
18.	Ik ervaar mijn omgeving niet als aanmoedigend.		
19.	Ik krijg niet voldoende steun en supervisie van mijn therapeut.		
20.	Ik voel mij onbegrepen door mijn therapeut.		
21.	Ik heb onvoldoende vertrouwen in de verantwoordelijke therapeut.		
22.	Zijn er andere factoren die ervoor zorgen dat uw motivatie afneemt welke niet vermeld zijn in bovenstaande vragen? Gelieve deze hier op te schrijven.		
23.	Volgende factoren vond ik positief tijdens mijn revalidatieprogramma (bv.: begeleiding, aard van het programma, duur, …):		

APPENDIX 5: motivationele factoren (bij niet gedaalde motivatie)

U bent gemotiveerd. Welke reden kan u hiervoor aangeven? *Duidt aan welke uitspraken het beste overeenkomen met uw redenen en rangschik ze vervolgens naar belangrijkheid,* *waarbij nummer '1' het belangrijkste is:*			
1. Ik train graag in groep.			
2. Ik train graag individueel.			
3. Ik vond mijn begeleidende therapeuten erg bekwaam.			
4. Ik krijg professioneel advies.			
5. Ik voel me gemotiveerd door mijn eigen verwachtingen.			
6. Ik ervaar plezier in het revalideren.			
7. Revalidatie is een erg belangrijk aspect in mijn dagelijkse agenda.			
8. Ik heb het gevoel dat de oefeningen mij controle over de aandoening geven.			
9. Ik denk dat mijn oefeningen de aandoening verbeteren.			
10. Ik train graag in een revalidatiecentrum.			
11. Ik voel mij gezond en sterk.			
12. Ik heb het gevoel dat ik meer gemotiveerd ben door de leeftijd die ik heb.			
13. De revalidatie voldeed aan mijn initiële verwachtingen, omdat:			
14. Ik ben van mening dat beweging/oefentherapie/revalidatie mijn aandoening zal verbeteren.			
15. Mijn doelstellingen voor de revalidatie zijn nog niet bereikt, waardoor ik gemotiveerd blijf.			
16. Ik krijg veel steun van mijn sociale omgeving (familie, vrienden, andere patiënten) in verband met de revalidatie en ervaar hen als aanmoedigend.			
17. Ik krijg voldoende steun en supervisie van mijn therapeut.			
18. Ik voel mij begrepen door mijn therapeut.			
19. Ik heb voldoende vertrouwen in de verantwoordelijke therapeut.			
20. Zijn er andere factoren die ervoor zorgen dat uw motivatie toeneemt welke niet vermeld zijn in bovenstaande vragen? Gelieve deze hier op te schrijven.			
21. Volgende factoren vond ik positief tijdens mijn revalidatieprogramma (bv.: begeleiding, aard van het programma, duur, …):			

APPENDIX 6: non-compliantie factoren

Duidt aan wat van toepassing is en highlight vervolgens welke 3 uitspraken het beste overeenkomen met uw redenen:	
Fysieke barrières	
1. Ik heb het gevoel dat mijn fysieke voorgeschiedenis mij beperkt in dit revalidatieprogramma.	
2. Ik heb een te lage fysieke fitheid voor dit programma.	
Psychologische barrières	
3. Ik kan mezelf niet goed motiveren.	
4. Ik schat mijn eigen kunnen en mogelijkheden laag in.	
5. Ik ben angstig.	
6. Ik heb stress.	
7. Ik voel me depressief.	
8. Ik heb het gevoel dat ik het revalidatieprogramma (duidt aan: duur/intensiteit/volume/praktische uitwerking) onderschat heb en het daardoor minder goed opgevolgd heb.	
9. Ik heb het gevoel dat ik de controle over mezelf en de aandoening verloren heb.	
10. Ik heb het gevoel dat ik mijn eigen gevoel van welzijn verloren heb.	
11. Ik ben van mening dat ik mijn leven zelf niet in handen heb en daardoor minder deelneem aan het oefenprogramma.	
Socio-demografische barrières	
12. Ik heb het gevoel dat mijn leeftijd een rol speelt in het volhouden van een revalidatieprogramma.	
13. Ik krijg onvoldoende sociale steun uit mijn omgeving en heb het gevoel dat ik daardoor minder deel neem aan het programma.	
14. Het krijgen van een vergoeding is op dit moment voor mij belangrijker dan het verbeteren van mijn aandoening.	
15. Mijn werksituatie zorgt voor een verminderde deelname aan het oefenprogramma.	
Klinische barrières	
16. Ik schat mijn aandoening als zeer ernstig in en heb angst om de aandoening te verergeren, waardoor mijn deelname aan een oefenprogramma geremd is.	
17. De pijn die ik momenteel ervaar is een beperkende factor voor het opvolgen van een revalidatieprogramma.	
18. Mijn vermoeidheid is een beperkende factor voor het deelnemen aan een revalidatieprogramma.	
19. Ik heb een gewrichtsaandoening die mij ervan weerhoudt een oefenprogramma vol te houden.	
20. Ik vind dat de behandeling te lang duurt, waardoor ik het programma niet kan volhouden.	
21. Ik voel me beperkt door mijn gewicht voor het volhouden van een oefenprogramma.	
Andere factoren die niet vermeld zijn in bovenstaande lijst	

Appendix 7:

	Training preferences T0 (categorie)	TPS
1	Zithouding (zithouding)	48
2	Tillen (job/studie)	47
3	Autorijden (autorijden)	45
4	Lopen/wandelen (sport en ontspanning)	36
5	Haarverzorging (lichaamsverzorging)	25
6	Lezen (sport en ontspanning)	20
7	Fietsen (sport en ontspanning)	20
8	Huishouden (huishouden)	16
9	Tv kijken (sport en ontspanning)	14
10	Langdurig staan (job/studie)	14
11	Strijken (huishouden)	13
12	Uit de kast tillen (huishouden)	12
13	Kindjes optillen (huishouden)	11
14	Taken die kracht vergen (huishouden)	10
15	Afwassen (huishouden)	10
16	Voor kind zorgen (huishouden)	9
17	Job studie (job/studie)	9
18	Koken (huishouden)	8
19	Belasting met gewichten (revalidatie)	8
20	Werken met een schop (job/studie)	7
21	Schooltas dragen (job/studie)	7
22	Hoofdbewegingen (autorijden)	7
23	Doek uitwringen (huishouden)	7
24	Traplopen (sport en ontspanning)	6
25	Met kind spelen (sport en ontspanning)	6
26	Dansen (sport en ontspanning)	6
27	Stofzuigen/poetsen (huishouden)	5
28	Staan aan de afwas (huishouden)	5
29	Computer (sport en ontspanning)	5
30	Boodschappen dragen (huishouden)	5
31	Aan de band staan en reiken (job/studie)	5
32	Voetbal (sport en ontspanning)	4
33	Tuinieren (sport en ontspanning)	4
34	Tennis (sport en ontspanning)	4
35	Schakelen (autorijden)	4
36	Motorrijden (autorijden)	4
37	Fitheid verbeteren (sport en ontspanning)	4
38	T-shirt aan of uitdoen (lichaamsverzorging)	3
39	Sport en ontspanning (sport en ontspanning)	3
40	Ramen wassen (huishouden)	3
41	Katapult schieten (sport en ontspanning)	3
42	Volleybal (sport en ontspanning)	2
43	Pendeloefeningen (revalidatie)	2
44	Langdurig gebukt staan (job/studie)	2
45	Gitaar spelen (sport en ontspanning)	2
46	Flessen opendraaien (huishouden)	2
47	Bovenhands werk (huishouden)	2
48	Bellen (sport en ontspanning)	2
49	Schilderen en pleisteren (job/studie)	1
50	Nek ROM (revalidatie)	1
51	Computer (job/studie)	1
52	Als passagier (autorijden)	1

Appendix 8:

Trainingspreferences T2 (categorie)	TPS
Driving a car (**Car/motor driving**)	35
Sitting posture (**Posture**)	32
Lifting (**Household**)	24
Lifting (**Work/study**)	20
Riding a bike (**Sport and recreation**)	19
Doing labor (**Work/study**)	16
Prolonged standing (**Work/study**)	15
Houshold (**Household**)	13
Walking (**Sport and recreation**)	12
Lifting children (**Household**)	10
Running (**Sport and recreation**)	9
Hair care (**Personal care**)	9
Power and cardio (**Sport and recreation**)	8
Gardening (**Sport and recreation**)	8
Lifting out of the closet (**Work/study**)	7
Driving a motorcycle (**Car/motor driving**)	6
Ironing (**Household**)	6
Overhand activities (**Household**)	5
Volleyball **(sport and recreation)**	5
Abdominal muscles training (**Sport and recreation**)	4
Catapult (**Sport and recreation**)	4
Cleaning (**Work/study**)	4
Playing the guitar	4
Flower art (**Sport and recreation**)	3
Tennis (**Sport and recreation**)	3
Dancing (**Sport and recreation**)	3
Material arts (**Sport and recreation**)	3
Climbing stairs (**Sport and recreation**)	3
Cooking (**Household**)	3
Doing the dishes (**Household**)	3
Cloth wring (**Household**)	3
Washing the windows (**Household**)	3
Watching television (**Sport and recreation**)	3
Computergaming **(Sport and recreation)**	3
Sitting in an airplane **(Sport and recreation)**	3
Reading (**Sport and recreation**)	2
Climbing (**Sport and recreation**)	2
Soccer (**Sport and recreation**)	2
Computer work (**Work/study**)	2
Weight loads (**Rehabilitation**)	2
Clothing	2
Wood splitting **(Household)**	2
Socializing (**Sport and recreation**)	1
Painting (**Work/study**)	1

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Richting: **master in de revalidatiewetenschappen en de kinesitherapie-revalidatiewetenschappen en kinesitherapie bij musculoskeletale aandoeningen**
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