

The impact of ‘functioning as focus in care’ on health status in terms of the International Classification of Functioning, Disability and Health in patients with a hematological-oncological disease

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Abstract

Background. The current healthcare is mainly focused on curing the disease instead of experienced physical and psychosocial functioning. The international classification of Functioning, Disability and Health (ICF) can be used to describe patients' functioning. To focus on functioning, improving health will be the central concept in contrast to curing the disease. 'Functioning as focus in care' is a new care strategy and will be tested in daily practice.

Aim. To determine the impact of a new care strategy called 'functioning as focus in care' on patients' current and desirable status of functioning in terms of ICF in hematological oncological patients' admitted at a hematological department.

Method. This study used a quasi-experimental pretest-posttest design, with a control- and intervention group. Data is collected using the 'last' thermometer questionnaire and daily nursing visits whereby functioning was discussed. Two-sample-t-test is used to analyse thermometer scores to identify changes in mean values between groups. Functioning is analysed using frequency of the ICF categories and its value. Association between the ICF categories with the Spearman's correlation coefficient.

Results. Thermometer scores shows an average of 6.7 at T0 and 6.2 at T1 in intervention- and control group, showing no significant difference ($p=1.000$). Gender had a significant effect on thermometer scores ($p=0.017$). Analysing functioning revealed the 30% most used ICF categories. Data about patients desirable status of functioning was lacking and it was therefore unable to compare patients current and desirable status of functioning.

Conclusion. The results demonstrated no impact on status of functioning in hematological oncological patients due to the low frequency of nursing visits during hospitalization. The study proved unable to determine patients' desirable status of functioning and may be used as a zero measurement for functioning in hematological patients.

Recommendations. Repeating the intervention with continued efforts for a longer study period was recommended.

Keywords. *ICF, International Classification of Functioning Disability and Health, Hematology, Health condition*

Introduction

Hematological-oncological diseases are a group of cancers associated with the blood and blood-forming tissues¹ and includes a wide variety in cancers and treatments²⁻⁴. Throughout the hospitalization and intense treatments of patients with a hematological-oncological disease, health care professionals generally focus on prevention and treatment of patient symptoms. In particular the acute and serious complications of the disease and treatment⁵. However, patients' do not only experiences complications and side effects from both their disease and treatment but also physical and psychosocial effects such as fatigue, anxiety and depressive symptoms⁶⁻⁹.

Several studies have shown the effects of an oncological disease on psychological health and the increased risk of distress in oncological patients¹⁰⁻¹². According to the National Comprehensive Cancer network¹³, distress can be defined as an unpleasant emotional experience of a psychological, psychosocial, and spiritual nature that may interfere with the ability to cope with the oncological disease, physical symptoms and its treatment. In addition to the psychosocial effects, both the disease and treatment are associated with the effects on quality of life¹⁴. Therefore, health care professionals should not only be focused on prevention and treatment of the acute symptoms and complications, but also on the experienced physical and psychosocial functioning as well¹⁵.

The international classification of Functioning, Disability and Health (ICF) is an classification that can be used to focus on functioning and supporting patients' self management¹⁶. The World Health Organisation (WHO) conceptual model of health [insert figure 1] includes the ICF and the International Statistical Classification of Diseases and related Health problems (ICD)¹⁷ to describe the status of health. The ICD classifies health condition, whereas ICF classifies functioning and the environmental factors. Both the ICF and ICD are essential in completing the description of health¹⁷.

The ICF provides a standard terminology and can be used to systematically describe patients' functioning and factors that influence functioning in all aspects of life^{18,19}. Functioning relates to how people function in everyday life, in the performance of activities and in the areas of life in which they participate¹⁶. Functioning is conceptualized as a result of the dynamic interaction between a health condition (disease or disorder) and contextual factors (environmental and personal factors)¹⁷. Functioning can be described in abilities, disabilities, resources and targets to get a complete overview of patients' health status¹⁶. Health status embodies the dimensions of physical, social and emotional function²⁰. Focus on functioning in care support patients' and gives patients' the ability to adapt to their health status¹⁶. Health and functioning are associated with, and not merely as a consequence of a

condition or disease²¹. To focus on functioning, improving health will be the central concept in contrast to curing the disease¹⁶.

The ICF uses five components when classifying functioning: Body functions and Structures, Activities, Participation, Environmental factors and Personal factors. Although, the last one, personal factors, are not classified yet, they are under construction²². The components are divided into chapters and each chapter exists of categories. Each of the categories describes an aspect of functioning or environmental factor. Every ICF category has a code. For example: pain (b280) and nausea (b535). The ICF includes over 1400 categories which makes it impractical in terms of its size to use all the ICF categories. Therefore, ICF core sets are developed to increase applicability^{23,24} Also for hematological patients, an ICF core set have been developed²⁵. A recent feasibility study in nurses who take care of patients after a Hematopoietic Stem Cell Transplantation shows that the core set is feasible to provide information about patients' functioning, from nursing perspective²⁶. In this study, the impact of using the ICF core set in nursing care in hematological oncological patients will be determined on patients status of functioning.

The hematology department in a University hospital in the northern parts of the Netherlands²⁷ has decided to provide a new care strategy with functioning as a central concept called 'functioning as focus in care'. This new strategy in which the ICF core set will be used by nurses to provide care, will be tested in daily practice. In the context of job differentiation for nurses²⁸ functioning will be made the main responsibility of the bachelor nurse. The new strategy 'functioning as focus in care' is characterised by daily nursing visits whereby patients' current and desirable status of functioning will be assessed and discussed. Making the difference between patients' current and desirable status of functioning as small as possible may have an impact on patients' health²¹.

Aim

The aim of this study was to determine the impact of a new care strategy called 'functioning as focus in care' on patients' current and desirable status of functioning in terms of ICF in hematological oncological patients admitted at a hematological department.

Method

Design

A quantitative study with a quasi-experimental pre- and post-test design²¹ was performed to determine the impact of the new care strategy on patients' current and desirable status of functioning.

A quasi-experimental design was suitable because an intervention- and control group was used without randomisation. The control group, including patients admitted between December 2018 and February 2019, was compared to the intervention group including patients admitted between March and May 2019 at the same department. The intervention, the new care strategy, was implemented in March 2019 as care as usual. All patients admitted before the new care strategy belong to the control group and all patients admitted after March 2019 belong to the intervention group.

In the new care strategy, called 'functioning as focus in care', bachelor nurses assessed, discussed and registered patients' current and desirable status of functioning during intake and daily visits. The control group did not receive daily nursing visits where functioning was assessed and discussed. The 'last' thermometer²⁹ was used to determine the impact of the new care strategy. The 'last' thermometer is a validated instrument translated in Dutch from the English version of the distress thermometer with an accompanied item list²⁹. The accompanied item list was mapped by an ICF expert into the core set for hematological patients.

Population and domain

The study population consisted of patients with a hematological-oncological disease. Patients were eligible if they were hospitalized at the hematological department, aged 18 years and over, and Dutch speaking. A convenience sample of all patients hospitalized at the hematology department in a University hospital in the northern parts of the Netherlands on November 2018 till May 2019 was included in the study. The sample size was estimated based on the study of Blenkiron et al.³⁰ with an effect size of three and a standard deviation of 2.46. If each group consisted of 37 participants, a power of 80% was reached.

Data collection

Data related to patients' current and desirable status of functioning were extracted from the electronic patient record and collected with an mHealth application³¹. This mHealth application was used to register patients' current and desirable status of functioning in the ICF categories presented in the WHO's conceptual model of health.

Data from the mHealth application were extracted at the end of the research period. Data were collected on: the frequency of ICF categories, the value of the ICF categories (negative,

normal and positive), the goals (the intended achievements of a patient) and the achieved goals. The ICF categories used for the data about functioning were blinded double checked by an ICF expert for content validity. Differences were discussed and adjusted if necessary. Only in the intervention group, data about functioning were available due to the new care strategy. The frequency of nursing visits was monitored for each individual patient reported in the electronic patient record by nurses.

Data related to the 'last' thermometer were collected on paper and processed into the data set. The demographic- and clinical characteristics; age, gender, hospital duration, diagnosis and the frequency of the intervention (the daily nursing visits) were gathered from the electronic patient record. All data were merged into one data set. Thermometer data and demographic data were collected in both control- and intervention group to compare. The number of nursing visits were only gathered in the intervention group because in this group nursing visits were performed.

Data analysis

Quantitative data were analysed using the software SPSS24 (IBM Corporate, New York, United States). Demographic and clinical data were analysed using descriptive statistics. The continuous data were checked for normality using the Kolmogorov Smirnov test. To describe characteristic, mean and standard deviation was used in case of normality. In case of skewness, median and IQR was used. The comparisons between the groups were carried out in categorical variables using chi-square test and in continuous variables either with t-test for independent samples.

A two-sample t-test was used to analyse 'last' thermometer scores to identify changes in mean values between and within the control and intervention group. Independent-samples t-test was used between-groups comparisons and the difference in change scores between T0 and T1. Paired t-test was used for the within-group analysis. Analysis of variance was utilized to analyse whether gender, age, hospital duration and medical diagnosis differ in thermometer scores. The statistical tests were justified because the groups were approximately normally distributed and the variable was continuous³². *P*-values of ≤ 0.05 were considered statistically significant.

The frequency of the ICF categories used and the goals made were analysed with descriptive statistics. The association between the ICF categories used were analysed with a chi square test because the association was measured between binary variables in a two by two table. Spearman's correlation coefficient was used to test the correlation between ICF categories. The correlations of 0-0.3 were considered weak, 0.31-0.50 moderate, 0.51-0.70

strong, and greater than 0.70 very strong. Association of the ICF categories were measured due to the concept of functioning^{16,33}.

Procedures

During the first day (T0: pre-test) of the admission and last day (T1: post-test) of hospitalization, patients completed the 'last' thermometer screening scale questionnaire on paper received from the bachelor nurse. Questionnaires were returned immediately after being completed. The last thermometer questionnaire was a numeric rating scale for patients diagnosed with cancer consisting of a line with a 0 to 10 scale²⁹. In the concept of functioning, we were not interested in a negatively charged topic such as 'last'. Therefore, we used the thermometer as a positively charged thermometer to fit better to the concept of functioning. Participants were asked to what extent they succeeded at this moment and the past week to do the things they found important. Indicating 'do not succeed' at 0 and 'succeed very well' at 10.

The last thermometer was accompanied by an item list²⁹. The item list consisted of 35 items that addressed five live domains; physical, emotional, spiritual, family/social, and practical issues. These items were used by bachelor nurses to discuss patients' functioning. The bachelor nurses were focused on patients' experienced physical and psychosocial functioning using the item list that was processed in the core set. The current and desirable status of functioning was assessed and discussed during intake assessment, daily or at least 3 times a week. Patients' status of functioning was discussed in terms of functioning characterized by what was important for the patient, whereby the desirable status was set in goals. Both the intervention- and control group were asked at admission and discharge to complete the 'last' thermometer screening scale by themselves on paper. However, in the control group, the bachelor nurses did not do special, daily nursing visits with patients' in which patients' functioning was assessed and discussed.

Ethical issues

The study was assessed to be non-WMO compliant by the Medical Research Ethics Committee of the University Medical Centre Groningen (*METC 2018/525*). The care strategy in both intervention- and control group was care as usual. The study was conducted according to the principles of the declaration of Helsinki²⁹ (*version 2018*), Good Clinical Practice (GCP) and the General Data protection Act³⁴. Nurses screened all new patients hospitalized at the hematology department for study eligibility based on inclusion criteria during the study period. Patients received an information letter, were asked to participate and signed an informed consent. Informed consent was not legally mandatory, we chose to

obtain written informed consent from all participants to comply with the hospital requirements. All data was anonymised and stored on a secured hard drive of the hospital for 15 years. Only researchers HAS and ABA had access to the data.

Results

Participants

All eligible patients in the period December 2018 till May 2019 with the diagnosis hematological oncological disease (n=214) were invited to participate in the study. Informed consent to participate in the study was given by 103 patients. Five patients did not meet the inclusion criteria and ten patients refused to participate. During the study, patients in both groups were lost to follow up if they not fill in one or both thermometer scores, through an organizational problem or from the nurses point of view. Ultimately, 37 patients in both the control- and intervention group were included for analysis.

[insert figure 2]

Baseline characteristics

Baseline characteristics are shown in table 1. The majority of the participants were male 56.8% (n=21) in the control- and 59.5% (n=22) in the intervention group. The median age of the participants was 64 (IQR:54-67) in the control- and 59 (IQR:50-64) in the intervention group. Age was skewed in both control- ($p=0.010$) and intervention group ($p=0.020$). Mean hospital duration was 18.38 days (SD15.7) in the control- and 21.51 days (SD 9.7) in the intervention group. The frequency of the intervention, the nursing visits, had a mean of 1.9 (range 1-4) during hospitalization. In 48.7% of the participants, the intervention took place at least twice. Medical diagnoses were divided in six groups. Leukemia was the largest medical diagnosis group in both control- 59.5% (n=22) and intervention group 32.4% (n=12). No statistical significant differences were found in gender ($p=0.814$), age ($p=0.128$), hospital duration ($p=0.304$), and medical diagnosis ($p=0,061$) between the groups. *P*-values were given by group.

[insert table 1]

Thermometer scores

Thermometer scores are highlighted in Table 2. As table 2 shows, no significant difference was found in thermometer scores when control- and intervention group were compared ($p=1.000$). The mean score for the control group was 6.7 (SD 1.89) at T0 and 6.2 (SD 2.01) at T1. The mean score for the intervention group was 6.7 (SD 2.11) at T0 and 6.2 (SD 2.19) at T1. There was no significant difference found between T0 and T1 within the

control- ($p=0.087$) and intervention group ($p=0.170$).

Closer inspection of the thermometer scores shows that only gender had an effect on the thermometer scores whereby women scored significantly higher than men ($p=0.017$).

[insert table 2]

Use of ICF categories

During the intervention, 317 (83 unique) ICF categories were used by patients. Table 3 presents the most used ICF categories (top 30% = 25 ICF categories) out of the 83 unique codes. Out of the 30% most used ICF categories, 12 categories belong to the component of Body functions and structures, ten to Activities and Participations and three to Environmental factors. Take care of own health (D570) was the most used ICF category ($n=26$). A total of 94 goals were made by the 30% most used ICF categories. The most used ICF category D570 had a total of 23 goals.

All of these ICF categories belong to the component of Body functions and structures were labelled as a negative factor except insight (B1644) and judgement (B645). In the component of Activities and Participation the values were equally divided. The categories related to the component Environmental factor and the values were normal to positive. There was also a value given to all of the 317 used ICF categories. 39% of the 317 used ICF categories were labelled as a negative factor, 31% as a positive factor and 30% as a normal factor. The most used component of the 317 used ICF categories was Activities and Participation ($n=138$). [insert table 3]

Associations between the most used ICF categories are shown in table 4. Significantly positively found associations ($\phi=.51$, $p<0.05$) were handling stress (D2401) with trust (B1266), work (D850) with food intake (B510), food intake (B510) with walking (D450) and pain (B280) with peers (E325). This means that more strengths or problems in one category are associated with more strengths or problems in another category. The associations were considered strong. [insert table 4]

Discussion

The aim of this study was to determine the impact of a new care strategy called 'functioning as focus in care' on patients' current and desirable status of functioning in terms of ICF in hematological oncological patients' admitted at a hematological department. Based on our findings, the results demonstrates no significant difference in 'last' thermometer scores ($p=1$) between intervention- and control group. Patients both in the intervention- and in the control group had an average score of 6.7 at T0 and 6.2 at T1. Whereby can be concluded that a slight decrease in 'last' thermometer scores will occur during admission. There was a

significant difference found in gender on 'last' thermometer scores $p=0.087$ whereby women scored significantly higher than men. Nurses identified a large variety of functioning aspects in hematological oncological patients. The number of these aspects in terms of corresponding ICF categories was $n=317$. Testing the new care strategy revealed the current status of patients functioning expressed in the 30% most used ICF categories and its significantly positively associated ICF categories. Half of the 30% most used ICF categories were labelled as a negative factor. In this study, data about patients desirable status of functioning was lacking due to the intervention. The number of interventions whereby nursing visits took place to discuss patients functioning was not carried out properly. Therefore, only patients' current status of functioning is described. The study proved unable to compare patients' current and desirable status of functioning.

The ICF categories found in this study related to hematological oncological diseases were comparable to the study of Scheuringer et al. (2010)³⁵. The majority of the retrieved ICF categories refer to body functions and activities and participation, and were labelled as a negative value³⁵. A Delphi study about meaningful registration shows that five indicators are relevant for patients³⁶. These five indicators are also included in the top 30% most used ICF categories. Family relationships (D760), psychological complaints (B1263), stress (D2401), sleep (B134) and nutrition (B510). All of these ICF categories except family relationships (D760) were generally labelled as a negative factor in the current study. ICF category family relationship (D760) is also referred as a positive factor with no problem in several studies^{37,38}. Although, these categories are included in the top 30% most used ICF categories, there were not classified in the top five most used categories in the current study. Furthermore, the study of Chapman et al. (2018)³⁹ shows that woman are more able to do what they want to do than men. This might be a possible explanation that woman scored significantly higher than men on 'last' thermometer scores in the current study where patients were asked to what extent they succeeded at this moment and the past week to do the things they found important.

Certain aspects must be considered and should be interpreted in light of its limitations. The main limitation was that the intervention has not been carried out as previously described. Nurses were deemed to have nursing visits with patients in which patients' functioning was assessed and discussed. The intervention took place less than two times during admission in the intervention group with an average duration of admission of 21.5 days. Therefore it can be concluded that the intervention was not carried out properly. Possible explanations for the incorrect implementation of the intervention were understaffing, insufficient training of conducting nursing visits about patients' functioning or inadequate process monitoring of a process manager⁴¹⁻⁴⁴. In 44.7% of the days of the study period

during the new care strategy no bachelor nurse was available to carry out the intervention. This is based on numbers of the hematological ward and might be a potential explanation that the results demonstrates no impact. Second limitation was that no real baseline measurement in the intervention group was presented. Nurses were already trained in conducting nursing visits before the new care strategy was carried out which may lead to contamination bias. Besides that, an additional training about functioning and ICF was given upon request of the department half of March. This training should take place earlier because the intervention started in the beginning of March. Third limitation was that the study included few patients who were hospitalized many times before the new care strategy at the same department, which is inherent to hematology patients. Those patients had knowledge and experience of earlier admissions and may led to higher 'last' thermometer scores. Finally, despite a lot of support is given by the researchers to hand the questionnaire, it turned out to be hard for nurses to hand the 'last' thermometer questionnaire to all patients at admission and discharge. That is why many patients were missed in the procedure. In addition, some patients were not able to fill in the last thermometer because of their health status and did not receive the 'last' thermometer questionnaire. Nevertheless, the required 37 patients were included in the study and the mHealth application to report data about patients functioning with the corresponding ICF categories provided a reliable way to report and to extract the data for scientific research. The involvement of an ICF expert (researcher HAS) ensured the content validity and make sure that the ICF categories are reported correctly.

The study should be repeated with more focus on the intervention to determine the impact and effectiveness of the intervention. Continued efforts are therefore suggested to succeeded. A recommendation will be training on the job and the presence and guidance of a process manager. Further research should investigate whether the outcomes of the repeated study are generalizable to the hematological oncological population.

Conclusion

The present study was designed to determine the impact on patients' current and desirable status of functioning in terms of ICF in hematological oncological patients. The results demonstrates no impact on status of functioning in hematological oncological patients. The study address a large variety of functional aspects in hematological oncological patients. The study proved unable to determine patients desirable status of functioning and has only identified patients current status of functioning with corresponding ICF categories. This study may be used as a zero measurement for status of functioning of hematological oncological patients by repeating the study with more focus on the intervention.

References

1. McGrath P. Qualitative findings on the experience of end-of-life care for hematological malignancies. *Am J Hosp Palliat Med* [Internet]. 2002 Mar 5 [cited 2018 Sep 23];19(2):103–11. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/11926440>
2. Mosher CE, Redd WH, Rini CM, Burkhalter JE, DuHamel KN. Physical, psychological, and social sequelae following hematopoietic stem cell transplantation: a review of the literature. *Psychooncology* [Internet]. 2009 Feb [cited 2018 Sep 30];18(2):113–27. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/18677717>
3. Klein M, Heimans JJ, Aaronson NK, Postma TJ, Muller M, van der Ploeg HM, et al. [Impaired cognitive functioning in low-grade glioma patients: relationship to tumor localisation, radiotherapy and the use of anticonvulsants]. *Ned Tijdschr Geneeskd* [Internet]. 2004 Oct 30 [cited 2018 Sep 30];148(44):2175–80. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/15559412>
4. Harder H, Van Gool AR, Cornelissen JJ, Duivenvoorden HJ, Eijkenboom WMH, Barge RMY, et al. Assessment of pre-treatment cognitive performance in adult bone marrow or haematopoietic stem cell transplantation patients: A comparative study. *Eur J Cancer* [Internet]. 2005 May [cited 2018 Sep 30];41(7):1007–16. Available from: <http://linkinghub.elsevier.com/retrieve/pii/S0959804905001486>
5. Johansson E, Larsen J, Schempp T, Jonsson L, Winterling J. Patients' goals related to health and function in the first 13 months after allogeneic stem cell transplantation. *Support Care Cancer* [Internet]. 2012 Sep 13 [cited 2018 Dec 16];20(9):2025–32. Available from: <http://link.springer.com/10.1007/s00520-011-1310-x>
6. Manitta V, Zordan R, Cole-Sinclair M, Nandurkar H, Philip J. The Symptom Burden of Patients with Hematological Malignancy: A Cross-Sectional Observational Study. *J Pain Symptom Manage* [Internet]. 2011 Sep [cited 2018 Sep 23];42(3):432–42. Available from: <http://linkinghub.elsevier.com/retrieve/pii/S0885392411000716>
7. Allart-Vorelli P, Porro B, Baguet F, Michel A, Cousson-Gélie F. Haematological cancer and quality of life: a systematic literature review. *Blood Cancer J* [Internet]. 2015 Apr 24 [cited 2018 Sep 23];5(4):e305–e305. Available from: <http://www.nature.com/articles/bcj201529>
8. Takekiyo T, Dozono K, Mitsuishi T, Murayama Y, Maeda A, Nakano N, et al. Effect of exercise therapy on muscle mass and physical functioning in patients undergoing allogeneic hematopoietic stem cell transplantation. *Support Care Cancer* [Internet]. 2015 Apr 27 [cited 2018 Sep 30];23(4):985–92. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25256376>

9. Braamse AMJ, van Meijel B, Visser OJ, Boenink AD, Cuijpers P, Eeltink CE, et al. A randomized clinical trial on the effectiveness of an intervention to treat psychological distress and improve quality of life after autologous stem cell transplantation. *Ann Hematol* [Internet]. 2016 Jan 30 [cited 2018 Dec 16];95(1):105–14. Available from: <http://link.springer.com/10.1007/s00277-015-2509-6>
10. Cormio C, Caporale F, Spatuzzi R, Lagattolla F, Lisi A, Graziano G. Psychosocial distress in oncology: using the distress thermometer for assessing risk classes. *Support Care Cancer* [Internet]. 2019 Feb 20 [cited 2019 Mar 15]; Available from: <http://www.ncbi.nlm.nih.gov/pubmed/30788626>
11. Zabora J, BrintzenhofeSzoc K, Curbow B, Hooker C, Piantadosi S. The prevalence of psychological distress by cancer site. *Psychooncology* [Internet]. 2001 Jan 1 [cited 2019 Mar 15];10(1):19–28. Available from: <http://doi.wiley.com/10.1002/1099-1611%28200101/02%2910%3A1%3C19%3A%3AAID-PON501%3E3.0.CO%3B2-6>
12. Richardson EM, Schüz N, Sanderson K, Scott JL, Schüz B. Illness representations, coping, and illness outcomes in people with cancer: a systematic review and meta-analysis. *Psychooncology* [Internet]. 2017 Jun 1 [cited 2019 Mar 15];26(6):724–37. Available from: <http://doi.wiley.com/10.1002/pon.4213>
13. NCCN Guidelines for Patients® | Distress [Internet]. [cited 2019 Mar 15]. Available from: <https://www.nccn.org/patients/guidelines/distress/files/assets/basic-html/page-1.html>
14. Prieto JM, Blanch J, Atala J, Carreras E, Rovira M, Cirera E, et al. Psychiatric morbidity and impact on hospital length of stay among hematologic cancer patients receiving stem-cell transplantation. *J Clin Oncol* [Internet]. 2002 Apr 1 [cited 2019 Mar 19];20(7):1907–17. Available from: <http://ascopubs.org/doi/10.1200/JCO.2002.07.101>
15. Mohty B, Mohty M. Long-term complications and side effects after allogeneic hematopoietic stem cell transplantation: an update. *Blood Cancer J* [Internet]. 2011 Apr 29 [cited 2019 Apr 4];1(4):e16. Available from: <http://www.nature.com/articles/bcj201114>
16. Stallinga H. Human functioning in health care: application of the International Classification of Functioning, Disability and Health (ICF). [Internet]. Rijksuniversiteit Groningen; 2015 [cited 2015 Jan 14]. Available from: https://www.rug.nl/research/portal/files/23973008/Chapter_8_.pdf
17. Organisation W health. International classification of Functioning, Disability and Health: ICF. 2001.
18. WHO | International Classification of Functioning, Disability and Health (ICF). WHO [Internet]. 2018 [cited 2018 Sep 23]; Available from:

- http://www.who.int/classifications/icf/icf_more/en/
19. Wiegand NM, Belting J, Fekete C, Gutenbrunner C, Reinhardt JD. All Talk, No Action? *Am J Phys Med Rehabil* [Internet]. 2012 Jul [cited 2018 Sep 23];91(7):550–60. Available from: <http://content.wkhealth.com/linkback/openurl?sid=WKPTLP:landingpage&an=00002060-201207000-00002>
 20. G ST& S. *Outcome Assessment in Rheumatology*, 3rd edn. Oxford: Oxford Univesity. 2003;
 21. Stucki G, Sigl T. Assessment of the impact of disease on the individual. *Best Pract Res Clin Rheumatol* [Internet]. 2003 Jun [cited 2018 Sep 30];17(3):451–73. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/12787512>
 22. Müller R, Geyh S. Lessons learned from different approaches towards classifying personal factors. *Disabil Rehabil* [Internet]. 2015 Feb 27 [cited 2019 Jun 7];37(5):430–8. Available from: <https://www.tandfonline.com/doi/full/10.3109/09638288.2014.923527>
 23. Cieza A, Kirchberger I, Biering-Sørensen F, Baumberger M, Charlifue S, Post MW, et al. ICF Core Sets for individuals with spinal cord injury in the long-term context. *Spinal Cord* [Internet]. 2010 Apr 12 [cited 2019 May 26];48(4):305–12. Available from: <http://www.nature.com/articles/sc2009183>
 24. Tschiesner U, Rogers S, Dietz A, Yueh B, Cieza A. Development of ICF core sets for head and neck cancer. *Head Neck* [Internet]. 2009 Feb 1 [cited 2019 May 26];32(2):NA-NA. Available from: <http://doi.wiley.com/10.1002/hed.21172>
 25. Haasjes J. Human functioning of patients after hematopoietic stem cell transplantation displayed with the International Classification of Functioning, Disability and Health: a Delphi study. 2016.
 26. Bakker J. To evaluate the usability of the ICF core set for HSCT patients, from the perspective of nurses: a feasibility study, Faculty of Medicine Theses, Master thesis. 2017.
 27. Bouius en Schuylenburg. *Adviesrapport Bouwen aan de toekomst van verpleegkundige zorg*,. 2017.
 28. NFU. *Handreiking proeftuinen VIP*. 2018;
 29. Tuinman MA, Gazendam-Donofrio SM, Hoekstra-Weebers JE. Screening and referral for psychosocial distress in oncologic practice. *Cancer* [Internet]. 2008 Aug 15 [cited 2018 Oct 26];113(4):870–8. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/18618581>
 30. Blenkiron P, Brooks A, Dearden R, McVey J. Use of the distress thermometer to

- evaluate symptoms, outcome and satisfaction in a specialist psycho-oncology service. *Gen Hosp Psychiatry* [Internet]. 2014 Nov [cited 2018 Oct 30];36(6):607–12. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0163834314001583>
31. BigMove Institute. eHealth application BigMove. 2016.
 32. A F. *Discovering statistics using SPSS*. 3th ed. London: SAGE publications Ltd; 2009.
 33. Patiënten eisen meer samenhang in de zorg - Skipr [Internet]. [cited 2019 May 19]. Available from: <https://www.skipr.nl/actueel/id38356-patienten-eisen-meer-samenhang-in-de-zorg.html>
 34. European_Parliament. General Data Protection Act.
 35. Scheuringer M, Kirchberger I, Boldt C, Eriks-Hoogland I, Rauch A, Velstra I-M, et al. Identification of problems in individuals with spinal cord injury from the health professional perspective using the ICF: a worldwide expert survey. *Spinal Cord* [Internet]. 2010 Jul 12 [cited 2019 May 25];48(7):529–36. Available from: <http://www.nature.com/articles/sc2009176>
 36. Experiment Zinvolle Registratie Van registratielast naar waardegedreven zorg [Internet]. [cited 2019 May 26]. Available from: [http://www.intensivistenopleiding.nl/downloads-39/files/ZIRE project FMS.pdf](http://www.intensivistenopleiding.nl/downloads-39/files/ZIRE%20project%20FMS.pdf)
 37. Khan F, Amatya B. Use of the International Classification of Functioning, Disability and Health (ICF) to describe patient-reported disability in primary brain tumour in an Australian community cohort. *J Rehabil Med* [Internet]. 2013 May [cited 2019 May 25];45(5):434–45. Available from: <https://www.medicaljournals.se/jrm/content/abstract/10.2340/16501977-1132>
 38. Schiariti V, Selb M, Cieza A, O'Donnell M. International Classification of Functioning, Disability and Health Core Sets for children and youth with cerebral palsy: a consensus meeting. *Dev Med Child Neurol* [Internet]. 2015 Feb [cited 2019 May 25];57(2):149–58. Available from: <http://doi.wiley.com/10.1111/dmcn.12551>
 39. Chapman JB. COMPARISON OF MALE AND FEMALE LEADERSHIP STYLES. *Acad Manag J*. 2018;
 40. Bergerot CD, Clark KL, Nonino A, Waliany S, Buso MM, Loscalzo M. Course of distress, anxiety, and depression in hematological cancer patients: Association between gender and grade of neoplasm. *Palliat Support Care* [Internet]. 2015 Apr 4 [cited 2019 Jun 17];13(2):115–23. Available from: https://www.cambridge.org/core/product/identifier/S1478951513000849/type/journal_article
 41. Tempest S, Harries P, Kilbride C, De Souza L. To adopt is to adapt: the process of implementing the ICF with an acute stroke multidisciplinary team in England. *Disabil*

- Rehabil [Internet]. 2012 Oct 29 [cited 2019 May 21];34(20):1686–94. Available from: <http://www.tandfonline.com/doi/full/10.3109/09638288.2012.658489>
42. Reed GM, Leonardi M, Ayuso-Mateos JL, Materzanini A, Castronuovo D, Manara A, et al. Implementing the ICF in a psychiatric rehabilitation setting for people with serious mental illness in the Lombardy region of Italy. *Disabil Rehabil* [Internet]. 2009 [cited 2019 May 21];31 Suppl 1:S170-3. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/19852707>
 43. Shortell SM, Marsteller JA, Lin M, Pearson ML, Wu S-Y, Mendel P, et al. The role of perceived team effectiveness in improving chronic illness care. *Med Care* [Internet]. 2004 Nov [cited 2019 May 21];42(11):1040–8. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/15586830>
 44. Degeling P, Maxwell S, Kennedy J, Coyle B. Medicine, management, and modernisation: a "danse macabre"? *BMJ* [Internet]. 2003 Mar 22 [cited 2019 May 25];326(7390):649–52. Available from: <http://www.bmj.com/cgi/doi/10.1136/bmj.326.7390.649>

Tables and figures

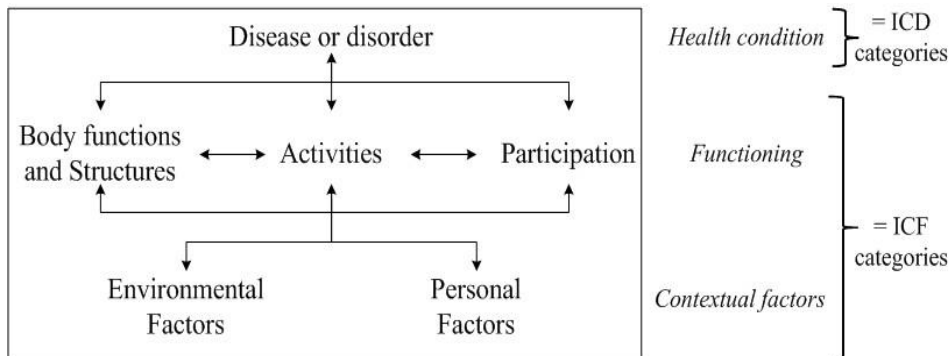


Figure 1. WHO's conceptual model of health representing the interactions between the components (disease, body functions and structures, activities, participation, environmental and personal factors) of the health status. ICD: International Classification of Diseases; ICF: International Classification of Functioning, Disability and Health¹⁶

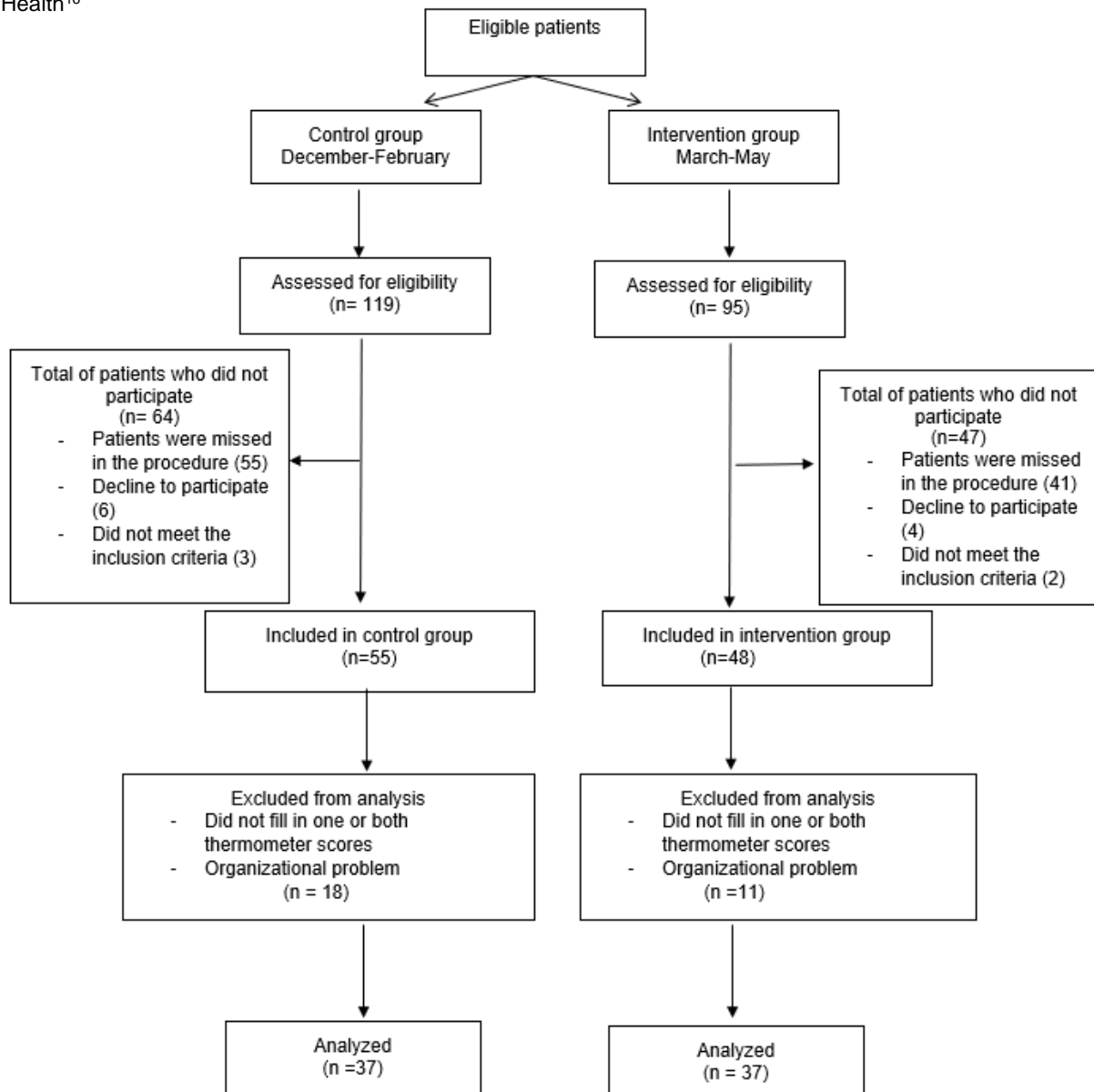


Figure 2: Flow diagram

Arends, A.B., The impact of 'functioning as focus in care' on health status in terms of the ICF; a quantitative study, June 25th 2019

Table 1. Patient characteristics

	Control group (n= 37)	Intervention group (n=37)	P-value
Variables: Total population (n=74)			
Gender, male, n(%)	21 (56.8)	22 (59.5)	0.814 ^a
Age, years, median (IQR)	64 (54-67)	59 (50-64)	0.128 ^a
Hospital duration, days, mean (SD)	18.4 (15.7)	21.5 (9.7)	0.304 ^a
Intervention frequency, mean, (range)		1.9 (1-4)*	
Medical diagnosis, n(%)			0.061 ^b
- Leukemia	22 (59.5)	12 (32.4)	
- Lymphoma	8 (21.6)	9 (24.3)	
- Multiple myeloma	3 (8.1)	11 (29.7)	
- Myelodisch plastic syndrome	1 (2.7)	3 (8.1)	
- Myeloproliferative disorder	0 (0.0)	1 (2.7)	
- Other	3 (8.1)	1 (2.7)	

a. independent samples t-test, b. chi-square test, * only intervention group receive the intervention due to the new care strategy, SD=standard deviation

Table 2. Thermometer scores

	T0 = pre-test		T1= post-test		Difference within group C		Difference within group I		Differences between group C and I	
	C group(n= 37)	I group(n=37)	C group(n=37)	I group(n=37)	Change	P-value	Change	P-value	Change	P-value
T scores	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	P-value	Mean (SD)	P-value	Mean (SD)	P-value
	6.7 (1.898)	6.7 (2.114)	6.2 (2.012)	6.2 (2.191)	0.5 (1.774)	0.0867	0.5 (2.231)	0.170	0 (2.015)	1.000

Table 3. Frequency of the most used ICF categories

ICF Code	Description	Frequency Total (n=231)	Percent %	Goals (n)	Value (%)		
					-1*	0*	1*
D570	Take care of health	26	8.20	23	30.8	38.46	30.8
D760	Family relation	23	7.26	8	4.3	21.7	74.0
E310	Family	23	7.26	0	4.3	56.6	39.1
D138	Gather information	20	6.31	6	15.0	50.0	35.0
B5350	Nausea	19	5.99	14	73.7	0.0	26.3
D2401	Stress management	16	5.05	6	75.0	18.7	6.3
B152	Mood	14	4.42	2	57.1	14.3	28.6
E1101	Medication	13	4.10	2	15.4	77.0	7.6
B1644	Insight	12	3.79	0	25.0	50.0	25.0
D770	Intimate relation	7	2.21	2	28.6	14.3	57.1
D550	Eat	6	1.89	6	83.3	16.7	0.0
B1266	Trust	5	1.58	5	100.0	0.0	0.0
B1263	Psychological stability	4	1.26	2	75.0	0.0	25.0
B1300	Energy	4	1.26	2	100.0	0.0	0.0
B134	Sleep	4	1.26	0	50.0	0.0	50.0
B1645	Judgement	4	1.26	1	25.0	75.0	0.0
B510	Food intake	4	1.26	4	100.0	0.0	0.0
B5250	Excretion of faeces	4	1.26	4	100.0	0.0	0.0
D850	Work	4	1.26	2	25.0	50.0	25.0
E325	Colleague	4	1.26	0	0.0	0.0	100.0
B144	Memory	3	0.95	3	66.7	0.0	33.3
B280	Pain	3	0.95	1	100.0	0.0	0.0
D450	Walk	3	0.95	1	33.3	33.3	33.3
D7600	Parent-child relation	3	0.95	0	0.0	0.0	100.0
D930	Religion	3	0.95	0	0.0	33.4	66.6

*-1=negative factor, 0=normal factor, 1=positive factor

