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A questionnaire to assess rehabilitation patients' experiences with motivational interviewing consultation in the context of physical activity stimulation

Trynke Hoekstra^{a,b}, Rolinde A. Alingh^a, Hendrik S. de Vries^c, Rik Bes^c, Femke Hoekstra^a, Cees P. van der Schans^d, Rienk Dekker^{a,e}, Florentina J. Hettinga^f  and Lucas H. V. van der Woude^a

^aCenter for Human Movement Sciences, University Medical Center Groningen, Groningen, The Netherlands; ^bDepartment of Rehabilitation Medicine, University Medical Center Groningen, Groningen, The Netherlands; ^cCentre for Motivation and Change, Hilversum, The Netherlands; ^dResearch and Innovation Group in Health Care and Nursing, Hanze University Groningen, Groningen, The Netherlands; ^eCenter for Sports Medicine, University Medical Center Groningen, Groningen, The Netherlands; ^fSchool of Biological Sciences, Centre of Sport and Exercise Science, University of Essex, Colchester, UK

ABSTRACT

Purpose: The current article provides a description of the construction process of a short questionnaire that measures patients' experiences with a motivational interviewing consultation by a (sports) counselor in rehabilitation. Subsequently, results from confirmatory factor analyses are presented to investigate a first perspective on factorial construct validity of the questionnaire.

Material and methods: Based on motivational interviewing literature, an initial item pool was created. All items were critically reviewed, resulting in the new "Evaluation of Motivational Interviewing Consultation on Active Lifestyle and Sports" questionnaire. The final items were determined by a confirmatory factor analysis based on 890 completed questionnaires.

Results: The initial 26-item questionnaire consisted of four inter-correlated subscales. Factor analyses underpinned the proposed factors: acceptance, evocation, partnership, and non-adherent. After removing six items, an alternative model remained and showed an acceptable model fit. The internal consistency of the subscales derived varied from 0.70 to 0.90.

Conclusion: The shortened questionnaire provides a feasible and easy to administer tool and may provide a cost saving method of assessing motivational interviewing fidelity from a patient's perspective in disability and rehabilitation.

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► IMPLICATIONS FOR REHABILITATION

- Many persons with a physical disability do not obtain the recommended amount of physical activity in order to maintain health.
- Stimulation of a physically active lifestyle through motivational interviewing is promising.
- Measuring motivational interviewing treatment fidelity is time consuming and often from a counselor's perspective.
- We developed a short questionnaire facilitating the assessment of treatment fidelity at the side of the client.
- Our questionnaire provides a feasible and easy to administer tool for assessing MI fidelity in daily rehabilitation practice.

Introduction

Given the fact that many persons with a physical disability and/or chronic disease do not obtain the recommended amount of physical activity in order to maintain health [1,2], stimulation of a physically active lifestyle in this population is of utmost importance [3–5].

Eliciting behavior change through motivational interviewing (MI) is promising in this respect. MI is "a collaborative counseling style for strengthening a person's own motivation and commitment to change" [6]. It is a person-centered conversation style used to elicit behavior change in people by enhancing their intrinsic motivation and resolving ambivalence. The popularity of MI has increased throughout the recent years and has now been applied by a broad range of societal professionals such as counselors, psychologists,

coaches, and teachers [6]. MI is increasingly recognized as a promising intervention in the management of long-term health conditions across various patients groups, including in people with physical disabilities [7–9]. A recent review [9], for example, concluded that the addition of MI into usual care may lead to at least modest improvements in physical activity across various patient groups. The authors did conclude, however, that larger effect sizes could be achieved if higher MI treatment fidelity would be accomplished. This means that persons receive MI as intended. Treatment fidelity is indicative of patients' expressions of their desire, ability, reasons and need for change (i.e., change talk). In turn, increased change talk has been found to be an important predictor of actual behavioral change. However, simply following the same amount of training is not a guarantee for successful behavioral change

because the amount of training required to achieve a certain level of MI skills varies among counselors [10]. In addition, combining ongoing training, observed practice, and coaching seems necessary for acquiring and maintaining sufficient competence in MI. Therefore, it is important to regularly monitor the level of MI skills among counselors [11].

Two well-known MI counselor fidelity assessments are the Motivational Interviewing Treatment Integrity (MITI) [12–14] and the Motivational Interviewing Skills Code (MISC) [15,16]. Both instruments are behavioral coding systems and require independent observers to score counselors' and/or patients' utterances by counting specific behaviors and giving global scores. Although both measures have become the standard for assessing MI fidelity, they have some important caveats (i.e., intensive training requirements, observational assessment, and time-consuming analyses) [17]. In particular, these measures focus on the counselor's role much more than on the client's role and perceptions on MI.

There is a strong need for a short questionnaire facilitating the assessment of MI counselor fidelity at the side of the client. Since it transpired that counselors' self-reports of their MI skills appear inaccurate and unrelated to actual practice proficiency ratings by skilled coders [18], developing a questionnaire that has to be filled out by counselors seems unsuitable. Additionally, there is evidence that patients are well able to identify MI consistent counselor behaviors [19,20]. These findings suggest that a short questionnaire filled out by the patient and measuring patients' perceptions of counselor MI use could be helpful in the assessment of MI fidelity. This notion is further supported by the fact that the client also seems to play a role in determining the efficacy of MI [21–23].

To our knowledge, the only validated instrument measuring clients' perceptions of clinician MI use is the Client Evaluation of Motivational Interviewing (CEMI) [24,25]. However, the CEMI items are formulated generically rather than focusing on the experiences of patients with a MI consultation within a specific setting such as rehabilitation. It may be that the setting of the MI consultation or the target behavior discussed influences the patient's experiences. Given the uniqueness of healthy lifestyle counseling within the health care setting and the increasing focus on physical activity counseling, the use of a specific assessment tool is deemed to be required.

Therefore, we constructed a new questionnaire, called the "Evaluation of a MI Consultation on Active Lifestyle and Sports" (MICAS), based on literature on the conceptual background and underlying mechanisms of MI and existing questionnaires described above. The questionnaire was developed as part of the Rehabilitation, Sports and Active lifestyle (ReSpAct) study, which aims to evaluate a tailored physical activity counseling program in patients with physical disabilities [26]. The program aimed to stimulate an active lifestyle in patients subsequent to the rehabilitation period, which explains the specific focus of the questionnaire. The purpose of the MICAS is to assess patients' experiences with a MI consultation by a (sports) counselor; the MICAS is assumed a potential measure of MI fidelity. The current article first provides a description of the construction process of the MICAS. Subsequently, results from confirmatory factor analyses (CFA) are presented to investigate a first perspective on factorial construct validity of the questionnaire.

Methods

Conceptual background of MI

MI is a person-centered conversation style [6,27,28]. The underlying spirit of MI distinguishes four important interrelated aspects

(acceptance, partnership, compassion, and evocation). These aspects describe the "set of heart and mind" with which MI should be performed. It is suggested that all of these aspects have an experiential and a behavioral component, which together determine to what extent the underlying spirit of MI is experienced by the client. While keeping the spirit of MI in mind, skilled counselors make use of four key processes (engaging, focusing, evoking, and planning) and several core communication skills (e.g., asking open questions, affirming, and reflective listening) in order to conduct the conversation in a MI-consistent manner.

Construction of the MICAS

We followed a logical and empirical process in the construction of the MICAS. The development group of the MICAS consisted of two members of the research team ReSpAct (R.A. and F.H.) both trained in MI. Based on literature on the conceptual background and underlying mechanisms of MI described above [6,27,28], client-centered therapy and therapist/client relationship, an initial 45-item pool was developed for a questionnaire to be filled out by patients following a MI consultation, reflecting the major themes of MI (see above). Where needed, these themes were (slightly) adapted to reflect the setting of rehabilitation. The items included both descriptions of MI-consistent and MI-inconsistent behaviors as well as descriptions of the patient-counselor relationship. No items on communication skills were developed, because respondents are likely to have difficulty to recognize these skills [24,25] directly. Instead, there are items in the MICAS addressing communication skills indirectly, reflected by the four subscales. Additionally, no items were developed on the element of compassion, because this element has been added to the spirit of MI in order to describe the way a counselor should act (i.e., in pursuit of the client's welfare instead of counselor's self-interest) rather than to describe a personal feeling or an emotional experience.

Both members of the development group critically reviewed all items to identify items that lack clarity or that may not fit with the conversation's purpose or themes. Also preliminary face validity was estimated by the development group. Then, a member of the Motivational Interviewing Network of Trainers (MIINT; R.B.) and other experts from academia and the target group, provided feedback leading to consensus. The experts were asked to specifically check the items on face validity and the expected discriminative power of the items to distinguish conversations that, to a greater or lesser extent, were conducted in a MI-consistent manner. Next, the resulting collaborative questionnaire was discussed and piloted among patients and trainers through observations and unstructured interviews until it was finalized for use in the ReSpAct study. In the process of reviewing all items, several items were revised or removed in several rounds among members of the research team. As a result, 19 items were removed, resulting in the current version of the MICAS.

Current version of the MICAS

The current version of the MICAS includes 26 items and aims to evaluate patients' experience with a MI consultation as a potential measure of MI counselor fidelity. It is expected that the MICAS contains four subscales related to the factors: Acceptance (10 items), Partnership (8 items), Evocation (3 items), and MI non-adherence (5 items). The MICAS has to be filled out by the patient directly after a MI consultation with a therapist/counselor. All 26 items are scored on a 5-point Likert scale. For 22 items, verbal

anchors were presented at the end points of the scale ranging from (1) “Strongly agree” to (5) “Strongly disagree”. For the remaining four items, different verbal statements were placed at each side of the scale.

The MICAS can be filled out in 5–10 min. The total score ranges from 26 to 130, with higher scores corresponding to counselors performing in a more MI consistent way during the consultation, thus demonstrating higher MI fidelity. Five MICAS items were negatively stated and scores for these items were reversed in data processes, so that a higher score reflects a more positive evaluation of the MI content of the consultation.

Study design and participants

Completed MICAS questionnaires filled out by adults (≥ 18 years) with a physical disability and/or chronic disease who participated in the ReSpAct study [26] were used. All patients who participated in the ReSpAct study and received an MI-based tailored face-to-face consultation with a sports counselor were eligible to participate in this study. The MI consultation was part of the tailored counseling program which was evaluated within the ReSpAct study. As part of the ReSpAct baseline measurement, participants were asked to fill out the MICAS following their consultation with the MI-trained sports counselor. Based on the recommendation of a sample of 10 participants per item [29,30], a minimum sample size of 260 was considered sufficient.

The study was approved by the ethics committee of the Center for Human Movement Sciences of the University Medical Center Groningen. Participants who were eligible and willing to participate were asked to sign an informed consent form, as part of the ReSpAct study [26].

Statistical analysis

Completed MICAS questionnaires with missing scores were excluded. Consecutively, items that did not discriminate (i.e., $>90\%$ of patients gave the same score) were excluded from further analyses. Also, items with low item-total correlation (<0.30) and items that showed only low inter-item correlations (<0.30) were excluded. In addition, the reliability of each subscale was analyzed based on its internal consistency. Cronbach’s $\alpha < 0.60$ was considered unreliable.

To investigate the factorial validity of the MICAS, an initial CFA was performed via Structural Equation Modelling using the LISREL 8.80 software package (Scientific Software International) [29,30]. The validity of the expected four-factor structure was examined. Because data were categorical, analyses were performed on the polychoric correlation matrix and the asymptotic covariance matrix using the weighted least squares (WLS) estimation method [29,30]. Factor loadings and modification indices for factor loadings and latent variables were checked. Items with non-significant factor loadings that could not be attributed to another subscale were deleted. Modifications of the initial model were only performed when theoretically plausible. Then, a second CFA was performed on the modified model.

In order to evaluate the fit of the initial and the modified model, several goodness-of-fit statistics were used. The Chi-square test was assessed because it is the most conventional fit index indicating the degree of discrepancy between the sample’s variance/covariance pattern and the model [31–33]. Also two other absolute fit measures were assessed: the root mean square error of approximation (RMSEA) and the standard root mean square residual (SRMR) [29,30]. For the RMSEA, a cutoff value close to

Table 1. Descriptive statistics of characteristics of 890 patients who completed the MICAS and mean (\pm SD) scores on the final 20-item MICAS.

		MICAS score ^d
Gender: % (n = 890)		
Male	45.8%	88.2 \pm 11.7
Female	54.2%	87.5 \pm 12.7
Age in years: mean \pm SD (n = 880)	50.1 \pm 13.5	
BMI in kg/m ² : mean \pm SD (n = 884)	27.3 \pm 5.7	
Educational level (n = 885)		
Primary school	4.1%	90.4 \pm 9.6
Lower secondary education	32.9%	87.7 \pm 12.7
Upper secondary education	37.4%	87.9 \pm 12.6
Tertiary education	25.6%	87.6 \pm 11.3
Ethnicity (n = 888)		
Dutch natives	89.9%	88.1 \pm 12.0
Non-natives ^a	10.1%	85.5 \pm 14.1
Rehabilitation treatment (n = 890)		
In-patient	2.7%	
Out-patient	89.3%	
Medicine consultations only	8.0%	
Diagnosis group: n (%) (n = 877)		
Stroke	143 (16.3%)	
Chronic pain	136 (15.5%)	
Heart disease	84 (9.6%)	
Cerebrospinal disorder	72 (8.2%)	
Acquired brain injury	67 (7.6%)	
Spine or trunk disorder	57 (6.5%)	
Rheumatic disease	57 (6.5%)	
Lower extremity amputation	44 (5.0%)	
Other ^b	216 (24.7%)	
Stage of change (n = 796)		
Precontemplation	1.3%	82.9 \pm 12.4
Contemplation	16.1%	85.9 \pm 12.1
Preparation	21.1%	87.8 \pm 12.0
Action	31.2%	88.2 \pm 12.3
Maintenance	30.4%	88.1 \pm 12.6
Intention ^c : mean \pm SD (n = 802)	7.7 \pm 1.7	

SD: standard deviation.

^aNon-natives were defined as persons who have had at least one parent born abroad.

^bInfrequent disorders/diseases ($<5\%$) have been taken together.

^cIntention to be(come) regular physically active in the upcoming 6 months. Assessed by a Likert scale (range 0–10).

^dTotal MICAS score was calculated by summing all item scores of the final 20 items.

0.06 is assumed acceptable [29,30]. For the SRMR, values up to 0.08 are deemed acceptable [29,30]. Finally, the comparative fit index (CFI), which is an incremental fit index, was assessed. This fit index is often reported because it is less affected by sample size [29,30]. CFI values ≥ 0.95 are indicative of good fit [29,30].

Subsequently, a Chi-square difference test was performed to investigate whether the modified model significantly improved the model fit compared to the initial model. Based on the modified model, the final items of the MICAS were determined. Finally, the MICAS total score was calculated.

Results

For the examination of the factorial validity of the MICAS, a sample of 963 patients completed MICAS questionnaires was used. After exclusion of questionnaires with missing values, a final number of 890 completed questionnaires remained. Table 1 reports the characteristics of the 890 patients. The mean duration of the MI consultation with the sports counselor was 54.8 \pm 14.5 min.

Although most item scores were left-skewed, none of the 26 items had to be deleted because of poor discriminative ability. The four items with different verbal statements at each side of the scale showed poor item-total correlations (<0.30) and poor mean inter-item correlations (<0.20), and were therefore excluded

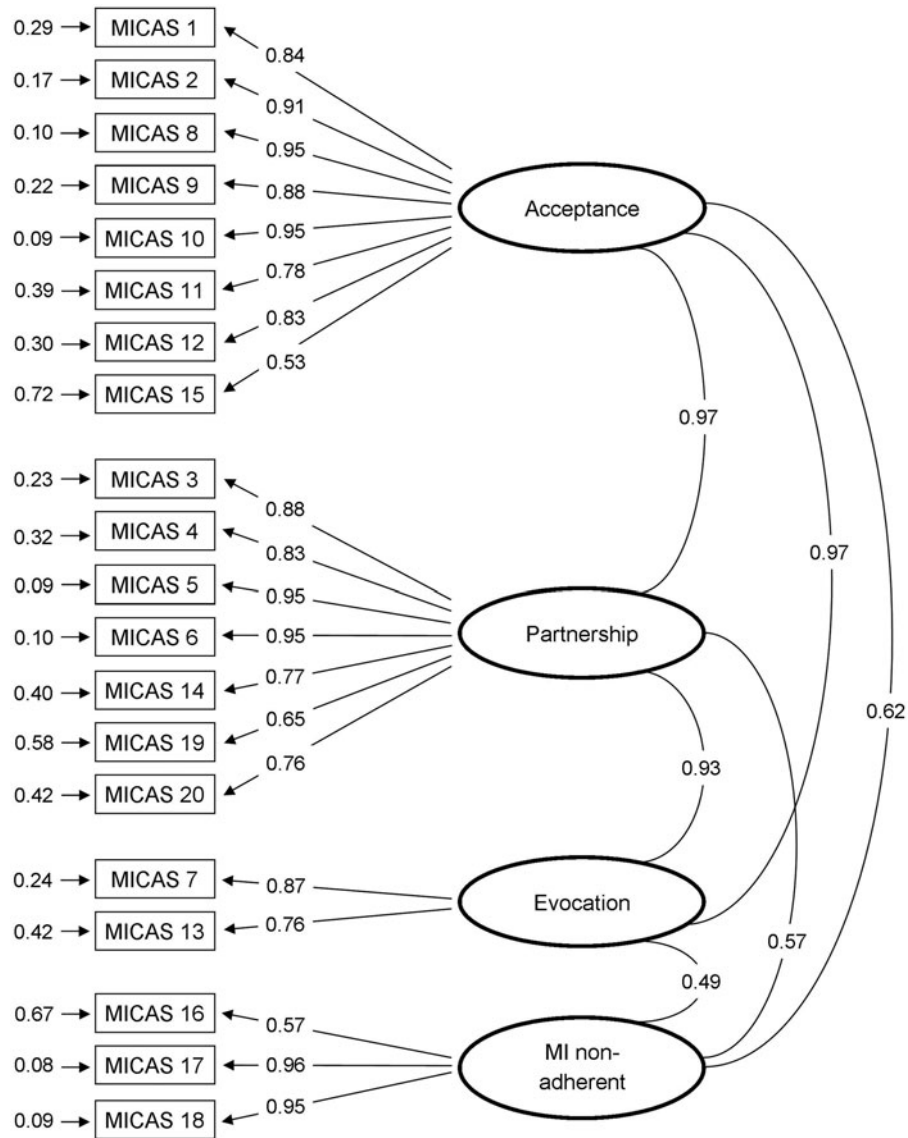


Figure 1. Factor loadings, factor covariance-scores and error variances of the MICAS items ($n = 890$) as obtained with confirmatory factor analysis.

from further analysis. The initial CFA was performed based on the remaining 22 items. Descriptive statistics showed that the mode score was 5 for all items, except for items 17 and 18 that had a mode score of 3. The answers to all items ranged from 1 to 5.

The 22-item CFA revealed that most of the model fit indices failed to meet the established criteria. Goodness-of-fit statistics were: $\chi^2(203) = 5834.13$, $p < 0.01$; RMSEA = 0.093; 90% CI of RMSEA = 0.089–0.097; SRMR = 0.13; CFI = .98. These results indicate that the data did not fit the initial hypothesized measurement model. All expected MICAS subscales showed acceptable to good reliability ($\alpha > 0.60$). Factor loadings were moderate to high (0.53–0.96), except for items 17 and 18 of the subscale MI non-adherent. These two items showed low factor loadings (< 0.20), which indicates that these items are not linked to the construct MI non-adherent as expected. This result was confirmed by inspecting the inter-item correlations of these two items. This revealed a relatively high correlation between both items ($r = 0.671$), but low inter-item correlations with the other items of the MI non-adherent subscale (0.038–0.312). Indicated by the modification indices and based on theoretical grounds, the two items could potentially be moved to the subscale Acceptance. However, because the item-total correlations (< 0.05) and inter-

item correlations of these items with the other Acceptance-items (-0.006 to -0.366) also showed to be low, the two items were still excluded for further analyses. After deleting items 17 and 18, a second CFA was performed.

The remaining 20-item CFA resulted in the following goodness-of-fit indices: $\chi^2(164) = 4580.76$, $p < 0.01$; RMSEA = 0.085; 90% CI of RMSEA = 0.081–0.090; SRMR = 0.080; CFI = 0.98. The analysis of the improvement of model fit by removing items 17 and 18 resulted in a χ^2 -difference value of 1253.37, $df = 39$, $p < 0.0001$, indicating that the modified model was significantly improved by removing the two items. All 20 items displayed significant moderate-to-high factor loadings (range: 0.53–0.96), indicating that the data fitted the modified measurement model of the MICAS (Figure 1). Cronbach's α of the 20-item MICAS and its subscales were: MICAS ($\alpha = 0.94$), Acceptance ($\alpha = 0.90$), Partnership ($\alpha = 0.89$), Evocation ($\alpha = 0.70$), and MI non-adherent ($\alpha = 0.71$). Figure 1 shows the final model including the covariance matrix among the latent variables and factor loadings. Covariance-scores between the three factors Acceptance, Partnership, and Evocation were high (> 0.90), indicating that these factors share a lot of common variance. Error variances ranged from 0.08 to 0.72. High error variances indicated that

the variance in scores on these items cannot be fully accounted for by the latent factor.

Based on the 20-item MICAS, total scores were calculated (Table 1). The mean score was 87.8 ± 12.2 .

Discussion

We constructed a new questionnaire in order to evaluate experiences with a MI consultation on active lifestyle and sports in patients with physical disabilities. The MICAS questionnaire is developed as a promising instrument for assessing MI counselor fidelity within daily practice. In contrast to the existing coding systems like the MITI and MISC which assess MI fidelity by analyzing the counselors' behavior, the MICAS questionnaire is intended to assess the same construct by analyzing the patient's perspective. Additionally, the use of patients' experiences with the consultation would make an independent observer redundant, which makes it a highly probable cost saving method.

The 20-item CFA illustrated a significantly improved model fit compared to the initial 22-item CFA. The suggested four-factor solution was supported, with good internal consistencies. The relatively high factor covariance-scores (>0.90) between the subscales: Acceptance, Evocation, and Partnership indicated that these factors share a lot of common variance. Since these constructs are based on the interrelated elements of the underlying spirit of MI [10], this result is not surprising. Several goodness-of-fit indices confirmed that the 20-item model fit the data. First, the CFI indicated a good fit of the 20-item model [29,30,34]. In addition, the SRMR outcome represented an acceptable fit [35]. However, the strongly significant Chi-square test outcome indicated that the model differs from the sample's variance/covariance pattern [29,30,34]. There are several reasons that may have caused this Chi-square test outcome: our data were left-skewed so the assumption of normality was violated, our large sample size has possibly ensured that small differences were reported as indicating statistically significant misfit between the expected model and the observed data [36], and our hypothesized model of the MICAS was relatively simple [34]. Since the SRMR is more sensitive for misspecification of factor covariance scores than for sample size or violation of distributional assumptions [36], more importance should be attached to the SRMR outcome compared to the Chi-square test outcome.

We found that patients scored relatively high on the MICAS questionnaire, with no clear differences across subgroups such as age, gender, rehabilitation setting, or stage of change phase (see Table 1). These findings suggest that patients gave a relatively positive and homogenous evaluation of the first face-to-face MI consultation with their counselor. High fidelity scores from a patient perspective might reflect general MI satisfaction, as for example was reported previously by Weinstein et al. [37]. This then might indicate that if patients are satisfied with their counselor's effort, this might influence in part the treatment fidelity ratings. Again, there is evidence that patients are well able to identify MI consistent counselor behaviors [19,20]. These findings suggest that a short questionnaire filled out by the patient and measuring patients' perceptions of counselor MI use could be helpful in the assessment of MI fidelity. This notion is further supported by the fact that the client also seems to play a role in determining the efficacy of MI [21–23]. Nevertheless, current assessments of treatment fidelity from a counselor's perspective, for example, via the MITI are time consuming and little applied [38].

Several strengths and limitations of our study should not remain unmentioned. To our knowledge, our study is the first to report on an easy to administer questionnaire reporting on MI treatment fidelity from a patient's perspective. This questionnaire fulfills an important gap which we were able to fill so by means of a large study sample and in an important, understudied setting. However, we did not provide a full overview of the psychometric properties of the MICAS questionnaire. We did not, for example, study the test–retest reliability. Because the purpose of the MICAS is to specifically assess treatment fidelity of one MI session only, analyzing test–retest reliability is not particularly relevant here. Moreover, although our CFA showed adequate model fit, error variances ranged from 0.08 to 0.72 (i.e., very low to relatively high), indicating that not all variance in the MICAS scores can be fully accounted for by the underlying latent factors and leaving room for improvement.

Practice implications

MI is increasingly used within disability and rehabilitation practice and related research for bringing about lifestyle changes. This is the first study that specifically focusses on measuring patient experiences of motivational interviewing in rehabilitation. The MICAS provides a feasible and easy to administer tool for assessing MI fidelity from a patient's perspective. The questionnaire as it stands now, has sufficient quality, is easy to administer and is feasible in practice (whereas the CEMI [24], e.g., is a more general questionnaire). Indeed patient's experiences were on the whole, fairly homogeneous, but they were very positive which is promising for practice. Further study is needed before the MICAS can be fully implemented in rehabilitation settings, but our study, indeed with several limitations, is unique and relevant for readers of Disability and Rehabilitation.

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ORCID

Florentina J. Hettinga  <http://orcid.org/0000-0002-7027-8126>

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