CLINICAL PRACTICE

Discrepancy in the evaluation of explicit and implicit nutrition care outcomes for patients at risk of malnutrition: A qualitative study

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Abstract

Background: Nutrition care plays a significant role in the prevention and treatment of malnutrition, although the challenge to establish the precise impact of a nutrition intervention on patient outcomes remains. Malnutrition can be associated with diverse underlying diseases and an increased risk of complications, which increases the difficulty of monitoring and evaluating the nutrition intervention. The aim is to gain an understanding of dietitians' reflections concerning nutrition care outcomes of interventions in patients at risk of malnutrition.

Methods: Six semi-structured audio-recorded focus group discussions with registered dietitians from primary healthcare and hospitals (n = 29) in Sweden were held at the dietitians' place of work or at the University. Focus group transcripts were analysed thematically to reveal patterns in the data and identify themes and subthemes.

Results: The dietitians described an approach to nutrition monitoring and evaluation of patients at risk of malnutrition that was categorised into three themes: (i) quantitative explicit outcomes, based on objective measures and described as rigorous; (ii) quantitative estimated outcomes, based on estimates and described as less rigorous and (iii) qualitative implicit outcomes, based on patients' subjective perceptions and experiences of their health and described as difficult to measure.

Conclusions: Findings indicate the need for new strategies to promote systematic and comprehensive nutrition monitoring and evaluation.

KEYWORDS
at risk of malnutrition, dietitian, monitoring and evaluation, nutrition care process, patient outcome assessment, qualitative research

Highlights
- Dietitians endeavour to quantify and measure rigorous outcomes to enable nutrition monitoring and evaluation of patients at risk of malnutrition.
- The dietitians described qualitative outcomes as those often being most significant to patients.
- Qualitative outcomes were described to be less well documented in the electronic health record and therefore implicit in nutrition monitoring and evaluation.

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INTRODUCTION

Although nutrition care plays a significant role in the prevention and treatment of malnutrition1-3, the challenge remains of establishing the precise impact of nutrition interventions on patients' outcomes4. It is estimated that around 50% of hospitalised patients have malnutrition3,5,6. Malnutrition implies risks for complications1 leading to difficulty in evaluating nutrition interventions that require the collection of structured data4,7. To provide dietitians with a systematic, structured framework8 for nutrition care, the nutrition care process (NCP) was developed by the Academy of Nutrition and Dietetics (formerly the American Dietetic Association). Over the past decade, experts from around the world have participated in reaching an international consensus about the components of the NCP model and its use as a framework7-9. This framework consists of four steps: (i) nutrition assessment; (ii) nutrition diagnosis; (iii) nutrition intervention and (iv) nutrition monitoring and evaluation (NM&E)7,8. Similar processes have been developed in other countries9,10.

Goals are desired outcomes, agreed with the patient, that link the nutrition intervention with the outcome1. Goals should be SMART (specific, measurable, achievable, relevant and timely)10. NM&E involves Monitoring: the procedure for measuring progress and ensuring that goals and expected outcomes are realised11 and Evaluation: the systematic comparison of current findings with previous status, intervention goals, effectiveness of care or a reference standard5. Evaluation also involves determining whether any changes have occurred in specific indicators. These indicators are quantitative markers that can be measured to determine the effectiveness of care12 or outcomes directly related to the nutrition diagnosis and goals of the intervention plan14. During NM&E, goals will therefore be considered achieved or be modified as necessary5.

In 2019, an NCP audit of healthcare records written by 77 dietitians revealed that goals were often not clearly documented15. An international survey-study (2019) investigating the implementation of NCP by clinical dietitians in 10 countries showed that the NM&E step was rarely implemented16. The documentation of outcomes in patients' records is essential for NM&E and continued nutrition care13. It may also contribute to transparency of care and promote the partnership between healthcare staff and patients17.

Evaluation of outcomes can guide evidence-based practice8, which forms the basis of dietitians' professional practice18. NM&E is important in promoting uniformity in the evaluation of the effectiveness of nutrition interventions15. In addition, quality of care and competence may be demonstrated through outcome management. However, there is limited research about how dietitians reflect on their practice of NM&E in patients at risk of malnutrition. Therefore, the present study aimed to gain an understanding of dietitian's reflections concerning outcomes of interventions in patients at risk of malnutrition.

METHODS

Study design

A qualitative study design was selected for this study. Focus groups with clinical dietitians were chosen as a result of their advantages in capturing the dynamic conversation between participants and gaining a deeper insight and understanding of the common experience of and reflections on the investigated topic20-22. Because the present study will form the basis for future interviews with patients at risk of malnutrition, patients were not involved in the research process.

Interview guide

A semi-structured interview guide was developed by the research team based on extensive discussions and literature concerning monitoring and evaluation of healthcare interventions, malnutrition risk, proposed strategies to ensure quality in qualitative research and the NCP5-3,5,6,21,23. The participants were asked to share thoughts and reflect upon monitoring patients at risk of malnutrition, evaluation of the nutrition treatment and measuring outcomes. Examples of interview questions included: what are your thoughts on evaluating the effect of the nutrition treatment of patients at risk of malnutrition? How would you describe a successful nutrition treatment? Do you face any difficulties in monitoring these patients? A pilot focus group with three dietitians resulted in minor revisions of the interview guide. Informative discussions emerging from the pilot focus group were also included in the final analysis. As part of a collaborative study, two focus groups included additional questions focused on NM&E of patients diagnosed with stroke and at risk of malnutrition. Data from these questions were not included in the study analysis.

Data collection

Purpose sampling was used to recruit participants24. The inclusion criteria were dietitians (i) with at least 1-years' experience of working with patients at risk of malnutrition and (ii) working at least 50% of full-time. Dietitians from five hospitals and three primary care settings in three regions in central Sweden were invited to participate. The dietitians worked in both high and low socio-economic status areas.

Information about the study was presented orally (SA) to dietitians at their regular meetings in the various healthcare settings to raise the issue of NM&E in malnutrition interventions and to call for study participants. Written information was emailed to those interested in participating. No information was collected regarding the dietitians who did not express interest in participating in the study. Dietitians working with diverse adult (≥18 years)
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Patient groups at risk of malnutrition were recruited from both primary care and hospitals to promote varied discussions. Interviews were held at the participants' workplaces for practical reasons; many dietitians in the respective focus groups therefore knew each other as colleagues.

Demographic data were collected at each interview. The sample size was guided by the analysis according to the principles of data saturation and was considered sufficient because no additional information regarding the topic emerged and no new themes were identified. Studies have shown that between three and six focus groups are sufficient to cover the majority of new issues in a study.

Two of the investigators, trained in qualitative interview techniques (SA and JM), alternated roles as moderator and observer, and the interviews were audio-recorded and transcribed verbatim. The observer made notes during the interviews, which were subsequently discussed between the moderator and the observer. Most participants were not acquainted with the moderator (SA); she was introduced as a PhD student interested in developing person-centred strategies in NM&E for patients at risk of malnutrition. The interviews were transcribed by (SA, JM and a professional transcriber). None of the interviews needed to be repeated. The transcripts were not returned to participants for comments.

Data analysis

The theoretical methodology used was inductive with a critical realist approach. The process of analysis was ongoing during and after the data collection and all aspects of the data were considered equally during the analysis. Thematic analysis was the process selected to analyse the verbatim transcripts. This is characterised by its methodical and interactive approach to understanding the meaning of a phenomenon within a specific context. The method was used to identify, analyse and report patterns in the data in line with the six-phase guidelines initiated by Braun and Clarke and with strategies proposed in qualitative research in dietetics. The transcripts were read several times (SA) and discussed with all authors to minimise data selectivity. Nvivo 11 (Qualitative Software for Research International) was used as a tool in the coding process and the systematic identification of themes. Similar content in the data was collected in meaning units, shortened, grouped into categories and subsequently categorised into main themes by the first investigator who conducted and analysed all the interviews. This step was carried out at the same time as keeping an open mind and the data were read several times (SA) and discussed with all investigators to ensure that the identified themes reflected the focus group discussions. In the final step, representative examples from each theme were extracted and discussed with all investigators in relation to the literature and the research question. As a result of extensive discussions at all stages of the analysis process, consensus was reached in the research group regarding the identified themes and subthemes. In the event of differing opinions concerning coding, the research group discussed the possible interpretations of the data until consensus was reached and everyone in the group was satisfied.

Research team

All the investigators are female and have extensive knowledge about malnutrition interventions and dietetic professional practice. Three (EL, MN and SA) are currently or were previously lecturers at a university dietetic education program. One of the investigators (YO) is responsible for the professional development of a large clinical nutrition and dietetic department. This combined experience has informed the method used in the study.

The Swedish Ethical Review Authority (Dnr 2019-02568) approved the study protocol. Oral and written information about the study purpose, voluntary participation and confidentiality was presented before each interview. Informed written consent was collected from each participant.

RESULTS

Six focus groups with registered dietitians from primary healthcare and hospitals (n=29) in central Sweden were conducted in 2019 (June to December); each lasted 90–100 min. Participant characteristics are reported in Table 1. The majority of the participants were women, with around 70% of participants having a working experience of over 10 years. All had a bachelor's degree in dietetics, with around one-third having completed a master's degree and one had a PhD. They all had experience of working with malnutrition interventions for patients with diverse underlying diagnoses, including chronic obstructive pulmonary disease, different cancer diagnoses, gastrointestinal diseases, and symptoms such as loss of appetite or eating difficulties that increase the risk of malnutrition. Almost half of the participants worked with either outpatients (n=11) or inpatients (n=3), whereas the rest (n=15) worked with both.

The dietitians shared their experiences and reflections concerning NM&E of patients at risk of malnutrition. These were categorised into three themes: (1) quantitative explicit outcomes, based on rigorous objective measures; (2) quantitative estimated outcomes, based on less rigorous estimates; and (3) qualitative implicit outcomes, based on patients' subjective perceptions and experiences of their health that are difficult to measure. The dietitians described striving to demonstrate rigorous quantitative outcomes in the electronic health record (EHR); other outcomes were less well documented in EHR and therefore implicit in NM&E.
Theme 1: Quantitative explicit outcomes

The dietitians described striving towards establishing goals that are rigorous and measurable. These were prioritised in NM&E and regularly monitored, documented and evaluated.

Explicit weight-related goals

Many dietitians stated that the main goals of nutrition intervention in patients at risk of malnutrition are either weight increase to normal body mass index (BMI) (kg m\(^{-2}\)) or weight stability.

Unfortunately often only weight … Not only weight but that’s what I write as the goal, weight stability or BMI over 22 … (Group F, person 1)

We’ve probably been … (Group B, person 1)

… influenced by NCP! (Group B, person 2)

Even during my dietetic education, before the Nutrition Care Process […] we were (told) to set SMART goals, it should be measurable (Group B, person 3)

However, some dietitians were critical of this weight-centred approach and discussed the disadvantages of focusing on weight. For example, they described how assessing weight in patients with body weight fluctuations associated with fluid
balance can be difficult. In addition, evaluation based on weight changes might not reflect the patient's goals.

Sometimes you get drawn towards setting goals that can be measured … we probably talked about something else, but I'll set this as a goal to follow up […] (Group B, person 4)

Measuring rigorous and objective outcomes

In one focus group, the dietitians expressed the desire to use laboratory values as indicators because these were considered to be measured values. However, they stressed the difficulty of using these in relation to nutrition interventions, thus making these values less valid.

I don't know what you should set that's measurable …? You may want them to maintain their weight, and albumin and iron values, but we know that these aren't only related to nutrition (Group B, person 1)

Dietitians working in hospitals emphasised the difficulty of reaching a weight-related goal during the patient's hospital stay. Instead, regular follow-ups and sometimes life-long interventions may be necessary to reach the intervention goal.

You can't treat malnutrition in three days … with blood sugar, you can get better control in three days, … but malnutrition can involve months of work or maybe it can never be reversed (Group D, person 1)

Although body composition was highlighted as a more reliable indicator compared to weight, many participants reported not having the equipment or routines for measuring this.

Theme 2: Quantitative estimated outcomes

The dietitians described other quantitative goals that they follow up in patients at risk of malnutrition, for example nutritional intake, food frequency and portion sizes. Outcomes related to these goals were described as less rigorous because they were based on estimates and therefore not always documented in the EHR.

Quantifying and measuring outcomes

Almost all dietitians stated that they quantify outcomes based on descriptions from patients or handover reports from healthcare staff. However, in one focus group, dietitians from primary care underlined that these are estimates rather than measurements and expressed uncertainties about the accuracy of these.

 […] how do you formulate your goals? (Group A, person 1)

Weight if it's possible to measure, that will be a pretty important factor, especially if it's someone who is underweight …, but also what they eat and maybe how many cooked meals, variety in the food eaten … but these are estimates rather than something exact (Group A, person 2)

In another focus group, some dietitians believed that the lack of precision in such outcomes contributes to selective documentation in the EHR, with estimated values not being documented because they felt unsure of the validity of these values.

… maybe (we should) not be afraid to estimate more, because we do estimate – eats a one-portion meal, which we know contains little protein, we estimate when we choose protein-rich oral nutritional supplements, but we maybe don't document it (Group F, person 1)

Maybe we shouldn't be afraid to write the estimated values but we don't dare to because we haven't measured them (Group F, person 2)

Some dietitians working in hospitals described how goals are based mainly on quantitative outcomes, such as energy or food intake, regardless of the dietary advice discussed with the patient.

… often for inpatients, I've calculated their energy requirement, and food and drink record charts have been completed, then I usually follow up how things have gone and check their weight …, they're the most common goals on the ward (Group F, person 2)

… and what the food and drink record chart has shown (Group F, person 3)

Regardless of what advice you've given […] (Group F, person 2)

Obtaining valid information through communication and reports

Dietitians working in hospitals discussed the need for reliable information to calculate values such as energy requirement and intake. Food and drink record charts and communication with other healthcare professionals were described as important sources of information, especially when patients are seriously ill and are unable to communicate. However, some reported that these charts were, at times, incomplete and handover reports
from other healthcare professionals or colleagues occasionally inadequate.

[...] sometimes when we get a handover report from another hospital, I’m told that the patient has eaten okay but when I ask some questions, ’but I don’t really know, I haven’t met the patient’. … they’re handing over the care of a patient who is basically not their patient (Group B, person 4)

Some dietitians working in primary healthcare expressed uncertainty about the validity of dietary histories and highlighted the challenge of obtaining accurate and reliable information in conversations with patients, particularly if the patient has memory difficulties. Some dietitians described assessing intake of oral nutritional supplements (ONS) by comparing the patient’s report of intake with the nutrition prescription. They highlighted that many times these do not correspond.

… it’s that thing with memory … it happens quite often … Maybe they say ’I drink two ONS a day … I still have enough left’ yet it was two or three months since you met them … it’s not possible. You see they haven’t ordered their next delivery (of ONS) … (Group A, person 3)

**Theme 3: Qualitative implicit outcomes**

The dietitians described establishing and monitoring qualitative goals with patients at risk of malnutrition that involve the patient’s subjective experience of their health. Such outcomes were less frequently documented and evaluated.

**Implicit goals of qualitative outcomes**

Many dietitians agreed that including the patient’s subjective experience of their health in NM&E was of enormous value. They believed that the patient’s well-being and positive changes in symptoms were at least as important in NM&E as quantitative outcomes. Some stated that they usually discuss and agree on qualitative goals with patients, yet these were less frequently documented in the EHR.

… I had a patient who wanted to go to their summer cottage, […] the goal was to make sure their nutrition care could function (there), although I might not have written that in the patient’s record … but that’s what it was in practice (Group D, person 2)

Quality of life? (Group D, person 3)

I think a lot is to do with quality of life (Group D, person 2)

Many dietitians believed that small changes can make major differences in enhancing patients’ well-being, such as being able to eat in the company of other people, enjoy their food and feel less stressed about eating. These changes may improve the patient’s general condition.

I think that some people still say that they have more energy or feel stronger. Or that now I’m able to get up the stairs, I couldn’t before. It’s that too (Group E, person 1)

Although qualitative outcomes were less frequently documented, many dietitians described considering them in conversations with patients. Some reported monitoring these outcomes by directly asking the patients. Others stated that they could perceive improvement in the patient’s condition in relation to qualitative outcomes without asking.

When they manage to eat, I can see by looking at them that their quality of life in relation to food has improved (Group D, person 4)

**Desire to focus on qualitative outcomes for comprehensive NM&E**

Many dietitians conveyed a desire to focus on qualitative outcomes to enable a broader approach to NM&E. They believed that by demonstrating these outcomes the comprehensive effect of a nutrition intervention can be identified. However, participants in all focus groups stated that these outcomes are rarely measured.

That question is always there … for my patients, they may maintain their weight [...] but … the food doesn’t taste good or it’s boring just sitting there …, how does it affect the way they feel, that’s what you would like to find out. … you can’t, there’s no way of measuring that (Group C, person 1)

Several dietitians believed that measuring qualitative outcomes might not necessarily improve the quality of the nutrition intervention for the patient. Others, however, emphasised the importance of measuring diverse outcomes to ensure that relevant interventions have been selected and to promote the development of the dietetic profession.

Some highlighted the lack of validated tools to measure qualitative outcomes, while others were familiar with some instruments but had no routine for using such measurements. Several dietitians expressed frustration at not being able to demonstrate qualitative outcomes or better define nutrition-specific effects.
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There is no opportunity to determine the outcomes other than weight gain. Although critical of the current EHR, some clinicians feel that the relationship between these dimensions has been described as limiting the ability of clinicians to measure the relationship between these dimensions. Hence, focusing on weight or BMI in NM&E may not reflect short-term outcomes of the nutrition intervention. Importantly, if relevant and short-term outcomes other than weight-related outcomes are not clearly documented, there is no opportunity to determine the effects of the nutrition intervention.

DISCUSSION

The present study aimed to investigate dietitian’s reflections concerning outcomes of interventions in patients at risk of malnutrition. By highlighting dietitian’s reflections, new strategies corresponding to dietitians’ requirements and the capacity for NM&E can be proposed for future development and the implementation of this step of the NCP. The findings highlight that dietitians endeavour to quantify and measure rigorous outcomes to enable NM&E for both the patient and the healthcare and the dietitian’s professional role.

… it’s important that it’s measurable for healthcare and the dietitian’s professional role. Then I sometimes feel that it’s the subjective aspects that are most important to the patient. But it’s not possible to get more dietetic positions on that basis. That my patients feel better after seeing me. […] and if the intervention doesn’t give any improvement you have to maybe try something else. So that’s why it’s important to have something you can measure (Group C, person 2)

Some underlined the difficulty of measuring and evaluating the contribution of the dietetic profession to healthcare.

… there is no easy tool for measuring what we do. […] It would be great … but there isn’t because it depends on so much else. … it may be that the patient was given a new medication that increased their appetite. Did I do something or is it to do with the patient … It’s really difficult. So it’s quite unique for our profession that it’s very difficult to measure (Group C, person 3)

Although qualitative outcomes were not documented explicitly, the dietitians discussed how, in practice, they rely on their clinical judgment to monitor these outcomes. A significant aspect of a professional’s clinical judgment is intuition, defined as a response without rational calculation. Intuition develops through experience and constitutes a substantial part of the everyday practice of experts. The dietitians described how they could sense if goals corresponded to the patient’s needs and if the patient’s condition was improving; however, this involves tacit knowledge that is difficult to verbalise and demonstrate in NM&E. Tacit knowledge is intuitive and is unconscious knowledge gained from experience. Explicit knowledge, on the other hand, involves rules, facts and policies that can be documented and shared without question. The findings in the present study highlight the gap between the tacit knowledge informing the dietitians’ practice and the explicit knowledge that the dietitians are keen to demonstrate.

There is evidence concerning the role nutrition plays in aspects of a patient’s life such as in well-being, quality of life and general health. Most participants underlined the significance of these in NM&E for both the benefit of patients and the development of the dietetic profession. Some participants suggested that qualitative outcomes could be used to complement the weight-centred approach described in this study, for example terms associated with qualitative aspects such as ‘Ability to build and utilize social network’ or ‘Nutrition Quality of Life’. However, as also discussed in previous research, dietitians tend to associate the NCP with quantitative outcomes. Some dietitians reported being trained in quantifying and establishing SMART goals. This may reflect the Swedish dietetic education because the participants highlighted that they were ‘trained’ in quantifying. The participants also reported emphasising quantitative outcomes in their documentation. However, if outcomes related to qualitative aspects are not documented, there is a risk of losing vital information that is important in the continuity of care.

Participants also described qualitative outcomes as those often being most significant to patients. In person-centred care, the EHR acts as a contract between patients and the healthcare staff whereby patients have access to the documentation in the EHR. Hence, emphasising patients’ priorities and goals through documenting qualitative outcomes in the EHR is of huge importance in enabling person-centred care and comprehensive NM&E. To provide patient-safe, person-centred care, all aspects of relevance and importance to patients should therefore be addressed in the process of NM&E.

The NCP includes a diverse range of NM&E terms that could be used to complement the weight-centred approach described in this study, for example terms associated with qualitative aspects such as ‘Ability to build and utilize social network’ or ‘Nutrition Quality of Life’. However, as also discussed in previous research, dietitians tend to associate the NCP with quantitative outcomes. Some dietitians reported being trained in quantifying and establishing SMART goals. This may reflect the Swedish dietetic education because the participants highlighted that they were ‘trained’ in quantifying. The participants also reported emphasising quantitative outcomes in their documentation. However, if outcomes related to qualitative aspects are not documented, there is a risk of losing vital information that is important in the continuity of care.
during the course of the intervention. However, PROM may not capture all aspects of a patient's complex situation; the qualitative conversation and the patient's stories will most often achieve a deeper dimension than can be reached using instruments such as PROM. For patients at risk of malnutrition, however, PROM may fill the gap between the explicit and implicit aspects of NM&E. Furthermore, as also suggested in previous research, there is a need to perform a broader and more comprehensive NM&E in the NCP\(^4\). This could be realised through highlighting existing qualitative elements in the process during dietetic education and in the implementation of the NCP. Likewise, a more comprehensive NM&E could also be promoted by developing the NCP through the addition of further important qualitative aspects.

**Strengths and limitations**

A strength of the present study is that the participants were recruited from different settings and work with patients at risk of malnutrition with diverse diagnoses, which promoted valuable discussions. However, the discussions reflected participants' perceptions and views, and should not be interpreted as characterising how they actually practice NM&E. An additional strength is that all authors have clinical experience of working with patients with malnutrition, have been involved in the entire analysis process and have experience of qualitative methods.

The data selection was limited to a concentrated geographical area, which is acceptable when using a qualitative approach. However, including participants from different regions in Sweden and complementing the data with patient interviews may have provided more insights into the topic.

Although we tried to obtain heterogeneous groups to stimulate interesting discussions, many dietitians wanted to be interviewed in their own healthcare setting for practical reasons. Many dietitians in the respective focus group therefore knew each other. However, they stated that they had not discussed the topic previously and that the focus group had given them new insights and reflections. The approach used in the present study was broad, involving dietitians working with outpatients and inpatients at risk of malnutrition with diverse diagnoses and needs. Further questions regarding differences in the practice of NM&E in these diverse settings would have promoted interesting discussions. We suggest therefore that additional research investigating these differences should be undertaken. We also propose new studies focusing on specific groups of patients who are at risk of malnutrition to identify particular aspects concerning these patients.

**CONCLUSIONS**

Our findings highlight a gap in NM&E because the dietitians described qualitative outcomes as being most important to patients yet these were implicit in NM&E. Instead, they described striving towards explicit quantitative outcomes to enable the process of NM&E. We stress that the specification of patients' perspectives in NM&E is necessary to promote person-centeredness, improve communication between patient and healthcare provider throughout the chain of care, and support evidence-informed practice of dietetic interventions. Hence, new strategies to elucidate patient's goals and priorities through a more comprehensive NM&E are required. By involving patients in setting goals, aspects of importance to patients can be followed up and evaluated. We suggest an investigation into how patients at risk of malnutrition reflect on NM&E to highlight their needs and improve NM&E practices among dietitians.

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**CONFLICT OF INTERESTS**

The authors have no conflicts of interest.

**AUTHOR CONTRIBUTIONS**

All authors participated in the conception and design of the study, as well as the analysis and interpretation of the data. Lina Al-Adili and Jenny McGreevy performed the data collection. Lina Al-Adili was responsible for drafting the manuscript. All authors contributed with critical revisions and supervision.

**ETHICAL APPROVAL**

Ethical approval was obtained from the Swedish Ethical Review Authority (Dnr 2019-02568).

**TRANSPARENCY DECLARATION**

The lead author affirms that this manuscript is an honest, accurate and transparent account of the study being reported. The reporting of this work is compliant with COREQ guidelines. The lead author affirms that no important aspects of the study have been omitted and that any discrepancies from the study as planned have been explained.

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**PEER REVIEW**

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**REFERENCES**

SUPPORTING INFORMATION
Additional Supporting Information may be found online in the supporting information tab for this article.

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