Scandinavian Journal of Caring Sciences
EMPIRICAL STUDIES
doi: 10.1111/scs.12943

A CHAT about health literacy – a qualitative feasibility study of the Conversational Health Literacy Assessment Tool (CHAT) in a Danish municipal healthcare centre

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Scand J Caring Sci. 2021; 35: 1250–1258

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Background: Understanding individual health literacy needs is crucial when designing supportive and effective health care. However, tools assessing health literacy in practice are lacking. The Conversational Health Literacy Assessment Tool (CHAT) was recently developed, but its ability to assess health literacy remains unexplored. We aimed to investigate the implementation and adoption of CHAT, its ability to increase awareness of health literacy among healthcare providers, and if CHAT could assess health literacy needs in patients.
Methods: We performed a qualitative feasibility study of CHAT among healthcare providers (nurses, physiotherapists and occupational therapists) who provide rehabilitation services for patients with noncommunicable diseases in a municipal healthcare centre in Denmark. The study used the RE-AIM framework (Reach, Effectiveness, Adoption, Implementation and Maintenance) to structure interview guide and analysis. We collected qualitative data from four small focus groups with healthcare providers (n = 11). The data were analysed using a deductive thematic three-step method for organising and interpreting data. All informants provided written informed consent prior to data collection.
Results: CHAT seems to be a feasible and efficient tool for assessing health literacy needs among individuals with different socio-demographic characteristics and with different diagnoses. CHAT was easiest implemented and adopted by healthcare providers, who were already familiarly with the concept of health literacy. The informants emphasised that an introduction to CHAT and health literacy as concept was valuable for the adoption. Some of them felt frustrated that they did not have opportunity and options to meet the health literacy needs identified by CHAT.
Conclusions: CHAT is a promising tool for assessing individual health literacy needs and increasing awareness of health literacy among healthcare providers. For successfully implementation of CHAT, we recommend developing a structured implementation programme, including an introduction to health literacy and an outline of the options for acting upon CHAT results.

Keywords: health literacy, organisational health literacy, rehabilitation care, RE-AIM, noncommunicable diseases, healthcare service, feasibility study.

Submitted 6 November 2019, Accepted 15 November 2020

Background

The prevalence of noncommunicable diseases (NCDs) and associated social inequalities is increasing across the globe (1,2). One contributing factor may be the increasing demand on individuals to understand health information, navigate complex healthcare systems and manage their own health (3). Such skills are highly dependent on health literacy (4-7). Health literacy is defined as *'...the combination of personal competencies and situational resources needed for people to access, understand, appraise and use information and services to make decisions about health. It includes capacity to communicate, assert and act upon these decisions'* (6). Health literacy is associated with social determinants of health (8,9), such as income, education and cohabitant status and may mediate associations between social determinants and health status

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(10,11). Moreover, low levels of health literacy are strongly associated with poor health outcomes (8,12). Health literacy arises from an individual's interaction with their environment and its social, institutional and political conditions (6). Thus, health literacy is not only a result of the competences and abilities required by an individual to interact with healthcare systems, but also depends on the complexity of these systems and the demands they place on individuals (13-15).

Organisational health literacy or health literacy responsiveness refers to the way in which services, organisations and systems make health information and resources available and accessible to people according to their health literacy levels (6). Improving health literacy responsiveness might help organisations to meet the needs among patients. This requires healthcare providers to be able to understand and meet the cultural and social needs of patients and support them in making decisions about their health (16). Organisational health literacy entails the systematic identification of individual health literacy needs (17). However, existing tools to assess individual health literacy are often constructed with a population perspective (18). Most tools are not designed for health promotion or clinical healthcare practices and provide little to inform immediately action. To address this, O'Hara et al. recently introduced the Conversational Health Literacy Assessment Tool (CHAT) (19). CHAT aims to support healthcare providers to engage in conversations with patients about specific health literacy strengths and challenges (19). It assesses patients' health literacy through ten questions across five themes (Table 1) I) *Supportive professional relationships,* II) *Supportive personal relationships*, III) *Health information access and comprehension,* IV) *Current health behaviours* and V) *Health promotion barriers and support*. CHAT has recently been translated into Danish and modified for the Danish context.

Table 1 Conversational Health Literacy Assessment Tool (CHAT) themes and questions (19)

Supportive professional relationships	Who do you usually see to help you look after your health?
	How difficult is it for you to speak with [that provider] about your health?
Supportive personal relationships	Aside from healthcare providers, who else do you talk with about your health?
	How comfortable are you to ask [that person] for help if you need it?
Health information access and comprehension	Where else do you get health information that you trust?
	How difficult is it for you to understand information about your health?
Current health behaviours	What do you do to look after your health on a daily basis? (Prompt for diet, sleeping habits, medication, and treatment plan)
	What do you do to look after your health on a weekly basis? (Prompt for exercise, physical activities, social activities, and visits to healthcare professionals)
Health promotion barriers and support	Thinking about the things you do to look after your health, what is difficult for you to keep doing on a regular basis?
	Thinking about the things you do to look after your health, what is going well for you?

Aims

To our knowledge, there are no peer-reviewed studies evaluating CHAT outside the initial conceptualisation work (19), leaving CHAT's potential to assess health literacy needs unexplored. Among healthcare providers in a municipal healthcare centre in Denmark, we aimed to investigate (i) the implementation and adoption of the CHAT tool, (ii) its ability to increase awareness of health literacy among healthcare providers and (iii) whether the CHAT tool could assess individual health literacy needs.

Methods

Our study was designed as a qualitative feasibility study. Feasibility studies can be defined as 'pre-study' research aiming to collect pieces of information to design plans for main studies (20). Research questions in feasibility studies can advantageously be centred around aspects of implementation and processes of adoption (20,21).

Setting and informants

We conducted our study in the rehabilitation unit within a Danish Municipal Healthcare Centre, which provides services to patients with NCD. The population of the municipality where CHAT was tested has an above average number of residents with low socioeconomic status and limited health literacy compared to the average in Central Denmark region (22). CHAT was implemented as part of a programme to increase health literacy responsiveness in the healthcare centre. Healthcare providers were familiar with health literacy levels in the municipality and the possible implications of health literacy to health status.

CHAT was tested in a convenience sample (23) of physiotherapists, nurses and occupational therapists (healthcare providers) working in four rehabilitation teams (cardiovascular disease, type 2 diabetes, low back

pain and chronic obstructive pulmonary disease). The informants included both males and females, who had diverse experience in rehabilitation services for patients with NCD's (from recently graduated to having many years of experience). Initially, CHAT was introduced to healthcare providers through a workshop. This was followed by a second workshop to support implementation, which focussed on the challenges and difficulties experienced using the tool.

The rehabilitation teams offer patients a start-up session, ahead of education and physical training, where CHAT was included. The start-up sessions include general introduction to the rehabilitation service and gathering of individual information on the patients, which could influence the rehabilitation service. For example, information about the patient's medical history, patients and healthcare providers exchanging of expectations for the rehabilitation service, as well as goal setting for progressions throughout the rehabilitation service. Besides this, establishing a trusting relation to the patient is an important function of the start-up session.

Data collection

Our data collection was performed as an iterative process (23). We initially conducted a self-administered online survey among healthcare providers to investigate if they had started using CHAT. The survey was not part of the data collection for the study, but served solely as a documentation of the use of the CHAT tool and to guide the design of the interviews. Approximately 30 weeks after introducing CHAT, we conducted four semi-structured focus group interviews with 11 healthcare providers (October and November 2019). There were 2-4 people in each focus group and each interview had a duration of approximately one hour. We used a qualitative version of the RE-AIM (Reach, Effectiveness, Adoption, Implementation, Maintenance) framework (24,25) as a theoretical model to conceptualise the feasibility test of CHAT. This included the following five dimensions: reach (R) refers to the characteristics of participants who are receiving the intervention; effectiveness (E) includes the outcomes of the intervention; adoption (A) represents the uptake in the current setting or organisation; implementation (I) assesses how the intervention was delivered; maintenance (M) investigates the extent to which the intervention is enforced over time (24). We omitted 'maintenance' as it was not relevant for a short-term feasibility study.

We developed a guide for the focus groups using information from the initial survey and the RE-AIM framework. The guide explored the healthcare provider's experience and perceptions of using CHAT and their opinions regarding the reach, implementation, adoption and effectiveness of CHAT. Each focus group discussion was recorded on a voice recorder. The four focus group discussions took place in the Municipal Healthcare Centre for convenience for the healthcare providers. Moreover, this was the original setting where the CHAT conversations took place as part of the start-up sessions. The first author (NHJ) facilitated the focus group discussions.

Ethics

In accordance with Danish law, ethical authority approval for noninvasive medical research is not required. The study was approved by the Danish Data Protection Agency (journal no. 2016-051-000001). All informants were informed about the study aims and that participation was voluntary. Each informant provided written informed consent before initiating the focus group discussions, and the facilitator encouraged informants to ask questions about the data handling processes, use of data and purpose of the study. The informants were also informed that data would be reported only in pseudo-anonymised format. To ensure anonymity, data were not reported separately for each rehabilitation team.

Analysis

The interviews were transcribed verbatim. We followed a three-step method for organising and interpreting data (23). We choose to perform a deductive analysis guided by the RE-AIM framework, as we aimed to assess themes with importance for testing feasibility (26) of the CHAT. The deductive approach ensured adherence to the focus of testing feasibility; however, we still aimed at keeping an openness towards unforeseen results embracing the often explorative agenda in qualitative research.

Firstly, we read and re-read the transcripts and identified meaningful text segments of raw data. Such units represented a single idea or piece of information and were coded independently based on the authors' interpretation. Secondly, we identified themes from the units based on the RE-AIM framework. These themes were used to understand the informant's experience of working with CHAT, thus reflecting the greatest possible internal homogeneity and external heterogeneity within themes (Table 2). Lastly, each theme was subject to a meaning condensation resulting in final themes of results.

We assessed our findings using peer triangulation (27), meaning that the authors reassessed final interpretations of data condensation. This ensures peer validity and enhances the accuracy of our interpretations. The analysis was performed in NVivo 12.

Table 2 Data condensation and codes used during analysis

Thematic data condensation	*Codes*
Reach	• Use of CHAT across patient characteristics • Difficulties in the use of CHAT among patients with different resources
Effectiveness	• Assessing health literacy strengths and limitations • Additional contribution to clinical practice • Identification of needs among patients? • CHAT theme's usefulness in assessing health literacy
Adoption	• Uptake among healthcare providers • Factors influencing adoption
Implementation	• Use of CHAT across the project period • Use of resources • Consistency in use • Barriers and facilitators to implementation
Future implications and difficulties	• Challenges for uptake and adaptation in daily practice • Future implementation • Establishment of initiatives/services based on findings through CHAT

Results

All healthcare providers had used CHAT in more than ten start-up sessions each prior to the interviews. The results are summarised in Table 3 and presented by themes in the following sections of results.

Reach

The majority of healthcare providers perceived CHAT as a valuable tool for assessing health literacy needs among patients with different socio-demographic characteristics and with different diagnoses. However, some healthcare providers recognised that CHAT was difficult to use among patients with limited capabilities. They would typically not respond to the questions as detailed as more resourceful patients. This prevented an in-depth assessment of health literacy. Healthcare providers emphasised that the issue about less reflective patients diminished when they themselves became more experienced in using CHAT and instigated follow-up questions to elicit more detail.

> 'It is in particular those, who does not say that much. They might not have a large vocabulary, or

Table 3 Overview of results in final themes

Theme	*Summary of results*
Reach (the extent to which CHAT could be applied in conversations with 'different types' of patients)	• Easy to apply in conversation with patients across different diagnoses and socio-demographic characteristics • Low linguistic capabilities among some patients acted as a barrier to assessing health literacy needs • Limited health literacy assessment was achieved among patients who did not engage deeply with CHAT questions
Effectiveness (ability to assess health literacy needs)	• Assessment of health literacy needs was more objective and structured compared to prior needs assessments • CHAT contributed in-depth knowledge of individual needs and difficulties • CHAT helped identify more vulnerable patients • CHAT helped patients became more reflective about how to manage their own well-being
Adoption (uptake among Healthcare providers)	• Healthcare providers needed to understand the concept of health literacy and CHAT needed to be contextualised to facilitate adoption among healthcare providers
Implementation (the process in which CHAT was adopted)	• CHAT was implemented either 'partly' with prechosen themes and questions or in its original version with all themes and questions. The latter approach led to a more structured assessment • CHAT was relatively easy to implement • Peer-to-peer supervision and support in the workshops increased successful implementation of CHAT
Implications for practice (translation of findings into adaptations of care plans)	• More tools to facilitate translation of health literacy needs into services were requested by the healthcare providers • High complexity in assessing client's barriers and facilitators was difficult to include in existing service

> they might just say that it is not difficult for them. In these situations, we do not get much assessed or we stay short of knowledge. It requires extra questions, when they provide short answers, so that they become reflective about these little things which could be interesting'

Effectiveness

The healthcare providers indicated that CHAT worked as an efficient framework for identifying health literacy needs, which were otherwise difficult to assess.

> 'It might be a harsh word to use, but before it was more random if we assessed it [health literacy red.]. Now we are more aware of evaluating it and try to reach more individuals...It is these types of questions that open the doors, which used to be very difficult to open'

For some healthcare providers, CHAT enabled identification of otherwise overlooked vulnerabilities. One healthcare provider explained that she had experienced patients, who she initially thought had adequate health literacy, but when using CHAT were found to be exposed in many areas of importance for their health management.

> 'We have experienced patients, who seemed to have adequate health literacy. However, through these questions we experienced that the patient was very exposed in many areas and I was surprised by how difficult it was for him to manage his situation'.

Thus, the healthcare providers became more aware of identifying health literacy needs, and healthcare providers reported that they by use of CHAT felt more equipped to disclose these needs in a systematic way.

Some informants experienced difficulty in transforming findings from the theme 'health information access and comprehension' into their practice. This point was raised early in the feasibility phase and the second implementation workshop helped address this challenge. The rationale for CHAT became more clear once the healthcare providers became more experienced in using CHAT in the start-up sessions and after having attended the two workshops. Moreover, the healthcare provider's feeling of ability to address all CHAT themes was associated with increased use of the tool and with familiarity with the concept of health literacy.

Adoption

There was a wide range of responses to the theme of adoption. Some healthcare providers experienced benefits from using CHAT early in the feasibility period, while others were more reluctant. CHAT was implemented and adopted more easily by healthcare providers who were familiar with the concept of health literacy and who initially deemed CHAT relevant for their practice.

> 'I have experienced a progress. At the beginning I thought, how do they expect me to make an assessment on these themes, the level of complexity is excessively high. I was loaded by the amount of data we got out of it. Later on, we have experienced that we were able to identify these exact areas where clients have challenges and where we need to follow-up on'

However, the healthcare providers highlighted that their awareness of health literacy increased during the feasibility test period of CHAT. Some highlighted health literacy as an important focus for increasing attendance among patients throughout the rehabilitation service.

Difficulties in adapting services based on findings from CHAT were a barrier for adoption. Some healthcare providers expressed frustration that they did not have relevant services to meet the health literacy needs identified by CHAT. The healthcare providers agreed that identifying health literacy needs was important for managing care plans and they identified CHAT as an important part of a new practice.

> 'Otherwise we lose the ones, who cannot navigate in this [if not identifying health literacy red.]. This project has nudged us more. We are running high-speed machinery and when somebody drops out [...] we never see them again... In the end, we are providing services for the ones, who are able to manage themselves. It is important to manage the ones with these difficulties...'

Implementation

CHAT was designed with a high level of flexibility, which allowed healthcare providers to choose among themes and questions. This flexibility and the open-ended question types were identified as valuable. They allowed in-depth dialogue on a specific theme when relevant, thus individualising the conversation. The healthcare providers had been using CHAT in different ways and reported different experiences. They emphasised that use of CHAT in its original form led to the most efficient assessments of health literacy needs.

> '... but when you start to integrate and slack a bit, something happens to the level of exploration... I have mostly tried to use it thoroughly and slavishly, having had the time to do so and experience its

> effect... By sneaking in the questions randomly, I do not get the same effect. When I select the questions that I think are most relevant for the patient, I lose the desire to investigate the difficulties. This is the major strength about the tool'

A local contextualisation of CHAT was required for successful implementation. Healthcare providers reported that they were motivated to use CHAT due to the introduction to health literacy, its implications for health status and the challenge of low health literacy in the municipality.

> 'The background information added valuable insight. [...]. The [health literacy red.] level of the population and an understanding of why we need to address these things. And also what we can do about it and where we are heading'

The workshops were appreciated by some healthcare providers, because they were able to discuss their challenges in adopting CHAT. Furthermore, the exchange of local experiences increased familiarity with CHAT and improved ability to assess health literacy.

Implications for practice

The ability to act on the findings from CHAT was difficult in practice. This issue was not fully addressed during the study period. The healthcare providers found it difficult to prioritise the identified needs because they operated with such a large and diverse group of patients.

> 'They all have some challenges, so it is about finding out which way to help them along as best possible. Through CHAT we clarify things, but I think we need even more tools to support the promotion of literacy, when we have identified the challenges'

Despite difficulties in abilities to act on the findings, the healthcare providers expressed an increased motivation for rethinking their rehabilitation services and extent collaboration with external agents in the municipality.

The healthcare providers' reservations towards CHAT and its relevance might be affected by their professional culture. This was also indicated by the healthcare providers, who argued that their professional background limited their ability to act upon some of the CHAT findings, because they were not used to act on health literacy needs.

> 'A lot of the things we address in CHAT are beyond our professional focus area. This becomes clear when we are dealing with less resourceful patients. Then we might need to moderate the topics we are managing. If things are going very bad at home with the wife or a girlfriend and the children are having issues, plus they are being obese, having high glucose and cholesterol levels, and have no good established contacts to their healthcare professionals; then we have to start at one place only. Because we cannot fix all this at once'.

In spite of these difficulties, the healthcare providers argued that using CHAT had been a valuable process and that it was important to use CHAT in future start-up sessions.

Discussion

Our results indicate that CHAT is a promising, easy adoptable tool to assess health literacy needs among patients with NCD. By facilitating the exploration of health literacy difficulties and strengths, healthcare providers gained new insights, which can be used to inform individualised care plans and to increase patient empowerment (6).

Several tools for assessing individual health literacy have been developed in recent years (28,29). The excising tools are mainly questionnaires using multidimensional structures and comprehensive measurement (29). However, no clear consensus on which health literacy dimensions to include in the tools exists (29) . The healthcare providers in our study highlighted CHAT as a valuable instrument, because it assessed health literacy in a 'broad' perspective by including multiple health literacy dimensions such as social support, ability to interact with healthcare providers, and ability to find good health information. However, CHAT was developed using the Health Literacy Questionnaire (5,19), and potential critical dimensions highlighted in other tools might therefore be overlooked when using CHAT.

Even though most existing tools measure health literacy with a score, comparative analysis across tools is in general not possible (18,28). CHAT does not aspire to such analyses and differs from existing tools by introducing the conversational approach (19). Our results indicate that this approach was valuable in a practical municipal rehabilitation setting. However, the diversity in conceptualisation of tools call for use of multiple instruments in some cases (28). Hence, the use of CHAT in combination with questionnaires might therefore potentially add more in-depth insights into the individual health literacy challenges encountered.

A review by Farmanova et al. identified barriers and facilitators for organisational health literacy (30). The barriers included among others a lack of awareness about health literacy, the complexity of health literacy tools and guides, and the low priority of health literacy-related activities (30). We found that awareness of health literacy increased after healthcare providers used CHAT during the feasibility study. Furthermore, with some support

and adaptions, CHAT was easy to adopt in a busy healthcare practice. Increased awareness and identification of health literacy needs among the patients encouraged healthcare providers to initiate design of more individualised care plans as part of rehabilitation services. On this basis, CHAT may prove to be a useful tool, which can counter some of the well-known barriers to achieving excellent organisational health literacy (30).

To successfully deploy CHAT, we recommend developing a structured implementation programme, including an introduction to health literacy and an outline of the options for acting upon CHAT results. This introduction also needs to contextualise health literacy in the specific healthcare setting. Our results revealed that the ongoing exchange of experience regarding the use of CHAT was important for healthcare provider motivation and feeling of ownership. CHAT should thus be accompanied by local implementation support, for example introductory and follow-up workshops and peer-to-peer supervision where local experiences are exchanged.

Low linguistic capabilities and those patients who did not respond in detail acted as a barrier to assessing health literacy needs using the CHAT tool. The healthcare providers reported that these patients were also the ones with the highest needs for individual support. More experience in the use of CHAT and the ability to adapt the questions made it easier to gather more in-depth assessment of health literacy among these patients.

Establishing a vigilant workforce able to meet the needs of individuals with diverse health literacy are a critical aspect of organisational health literacy (31). CHAT can potentially help achieve this goal. However, some healthcare providers expressed frustration that they lacked the tools or resource to meet the health literacy needs identified by CHAT. These difficulties engendered reservations about CHAT among the healthcare providers. The large diversity in health literacy difficulties assessed by CHAT feeds directly into the design of care plans. Our findings suggest a need for interventions that can facilitate relevant adaptations to align with identified health literacy challenges. This is acknowledged as an important area for healthcare practice to address (3,32). This underlines that CHAT might need to be accompanied by other supportive tools. Designing care models or plans with healthcare providers and patients using a bottom-up approach based on co-creation may help increase organisational health literacy responsiveness (33).

Strengths and limitations

Being one of the first to test CHAT, we chose a structured deductive qualitative approach to permit an open analysis of CHAT's strength and weaknesses in this feasibility study. Throughout this study, we applied Malterud's criteria for robust qualitative research; reflexivity, transferability as well as interpretation and analysis (34). Reflexivity is vital in qualitative work, since the researcher affects the process (34). Thus, in this study more researchers were involved in interpreting emerging themes from analysis. Serving both as implementation agents and evaluators might have introduced some bias to our results towards a more positive evaluation. However, involvement in the implementation process also revealed valuable insights to areas of implementation and adoption which otherwise might have been overlooked.

As this study relies on feasibility testing, it takes a deductive approach, than common in classic qualitative work (20). This is particular so, due to the framework of the analysis relying heavily on RE-AIM (21-22), with the intention to generate knowledge on feasibility of the particular tool, CHAT. Thus, some more explorative dimensions (of qualitative research) are deselected in order to adhere to the RE-AIM framework with feasibility in mind, which we believe is vital as a first step for a novel tool such as CHAT. We encourage more studies to explore CHAT as a tool, especially of a more explorative nature, and with long-term impact in focus. RE-AIM is considered a best practice framework for evaluating public health interventions (24,35) and transferred well to a smaller-scale intervention.

We only interviewed practitioners working in a single geographical location in Denmark, which might reduce the transferability of our results. The delivery of health care is culturally situated and an expansion of the study to include practitioners in different settings could provide useful insight. We designed our study to focus on healthcare providers experiences of using CHAT and did not examine the patient perspectives. Thus, future studies including the patient's perspectives are needed.

Focus groups are relevant to produce data on experiences within social groups (36). In general, focus groups consist of 6 to 10 informants (36). We choose to construct focus groups for each NCD rehabilitation team in order to identify potentially differences in use of CHAT across types of NCDs. Hence, our focus groups interviews had a small number of informants (2-4 informants), which might have influenced the relationship between the information and the facilitator, and the relationship between the participants positively (or negatively). Further, it may have limited the, in focus groups well-recognised, impact of the larger social structures within which the discussion took place.

Conclusions

CHAT is a promising tool for assessing individual health literacy needs and increasing awareness of health literacy among healthcare providers. CHAT may act as a tool to improve organisational health literacy. However, transforming care from the findings in CHAT remains difficult

and other tools are needed to effectively improve organisational health literacy. To successfully deploy CHAT, we recommend developing an implementation programme, including an introduction to health literacy as concept in healthcare practice and an outline of the options for acting upon CHAT results.

Acknowledgements

We would like to thank the healthcare providers from the rehabilitation teams in the Healthcare Centre where CHAT was implemented for providing valuable time as informants in this qualitative feasibility study. Furthermore, we would like to thank Sanne Palner for her ongoing support with facilitating the interviews.

Author contributions

NHJ, AA, HTM conceived the study question and designed the study. NHJ carried out the data collection. NHJ performed data analysis and KR assisted the analysis and interpretation of data. NHJ wrote the first draft of the manuscript and all authors critically revised the manuscript and approved final version.

Funding

We did not receive funding from any agency in the public, commercial, or not-for-profit sectors to complete this project. No conflicts of interest to declare.

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