Accessible Online Addiction Treatment for Patients with Mild or Borderline Intellectual Disability

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ABSTRACT

This paper describes a research project on how to make online addiction treatment suitable for patients with Mild or Borderline Intellectual Disability (MBID). This project is done in collaboration with a Dutch addiction treatment company, which developed an online addiction treatment program in collaboration with another company specialized in e-health. This research covers how these addiction treatment programs can be adjusted so that it takes patients with MBID into consideration. This is achieved by developing a new prototype with redesigned text and user interface, followed by analyzing that prototype through usability testing and interviews conducted with therapists experienced in this field. The contribution of this paper is that it concludes that designing effective online addiction treatment for patients with mild or borderline intellectual disabilities is achieved by following design requirements derived during this research. These requirements describe how to design readable information and display that information in a structure suitable for patients with MBID. The design requirements have been evaluated and discussed with therapists that have a strong background in therapy involving patients with MBID. These evaluations confirm the effectiveness of the derived requirements and highlighted the possibilities and restrictions of the current e-health environment in which modules are developed.

Keywords

User interface, MBID, Online addiction treatment

1. INTRODUCTION

Tactus developed an online addiction treatment program in September 2019 that offers online therapy sessions in collaboration with Minddistrict. These online programs are offered through web interactions with therapists and learning modules. The program has proven to be successful for patients as it is convenient. It allows patients to access treatment whenever they want, independently and easily accessible through the internet [1].

1.1 Tactus' online learning platform

The learning modules developed by Tactus are interactive sessions that a patient can complete independently. These modules offer information and guidance towards overcoming addiction. Therapists can track a patient's progress and provide feedback along the way. Most modules provide information and examples on how to overcome addiction, followed by questions to patients to personalize the problem. These modules convey a lot of information through text since both the background information in regards to addiction and user input is mainly conveyed through text.

1.2 Patients with MBID

One group of patients this program does not take into consideration, however, are patients with MBID. MBID refers to an adult having an IQ between 50/55 and 70/75. Adults with MBID are considered to have reduced cognitive abilities, including but not limited to a short attention span, limited memory, limited skills in drawing relations, and limited usage and understanding of words [11]. Studies show that although adults with MBID are less likely to consume alcohol or drugs compared to adults without disabilities, the ones who do are more likely to suffer from substance abuse [2][10]. Adults who suffer from substance abuse are candidates for the addiction treatment Tactus offers to help them overcome their addiction. Over the last few years, there has been an increasing demand for care and support in the Netherlands by people with intellectual disabilities [5]. The online treatment programs that Tactus offers contain a lot of text and information for the patient to interpret which patients with MBID fail to digest. The above points show that there should be a more suitable program for this specific group.

1.3 Research questions

Previous research explores suitable ways of displaying information to adults or children with MBID, examples of such research are the use of educational videos for middle school children with MBID [14] or designing easy-to-read texts for students with an intellectual disability [6]. However, specific research in the field of addiction treatment is lacking. Regular addiction treatment programs fail to be effective for adults with MBID and more research is required to develop suitable programs for this target group [10].

To make these programs suitable for patients with MBID research is required on how to display the information and questions shown in Tactus' addiction treatment modules so that it is interpretable for this target group. From this follows the main research question:

1. How can the addiction treatment modules of Tactus be adjusted so that it supports patients with MBID?

The addiction treatment modules of Tactus can be separated into two main components: the text written in said modules to communicate with patients and the user interface displaying

said text. Therefore, the following research questions form a base to answer the main research question:

2. How can text be written in such a way that it is readable for patients with MBID?
3. How can web content be adapted so that information is perceived easily by patients with MBID?

1.4 Approach

This research is carried out by first conducting literature research on how to design web content for people with MBID, which enables the first iteration of design requirements. These requirements serve as guidelines to verify whether the developed prototype is indeed suitable for patients with MBID. Second, an interview with one of the web developers of Tactus is conducted to familiarize with the Minddistrict environment in order to develop a prototype. The prototype is a module designed within the same environment as existing Tactus modules on Minddistrict. Afterward, the prototype is implemented based on requirements derived from literature research. The implementation of said prototype is done in agile software development. Meaning that requirements are altered during the development. After the prototype is finished, it is evaluated by Tactus therapists to verify whether it satisfies the requirements and whether the listed requirements are inclusive. If it does indeed satisfy the requirements, we can verify that it is possible to make web modules on Minddistrict that are suitable for patients with MBID.

1.5 Structure

The next section describes the requirements that have been derived from literature research. In section 3, the existing Tactus modules will be analyzed with said requirements to see why these are not suitable for patients with MBID. Additionally, limits of the Minddistrict environment are discussed. Section 4 describes the developed prototype. Section 5 describes the evaluation of said prototype through usability testing and interviews. Section 6 states the conclusions derived from evaluating the prototype. Finally, section 7 discusses the limitations of this research and proposed future research.

2. REQUIREMENTS

This section covers the design requirements of the prototype. The prototype is an online module implemented within the Minddistrict content platform. These design requirements ensure that the prototype is suitable for patients with MBID. These requirements have been formed in an agile software development cycle, meaning that requirements have been altered or added/removed throughout the development. Requirements have been set by means of literature research and interviewing a Tactus web developer prior to implementation. Requirements have also been altered after evaluating the prototype with supervisor and Tactus therapists experienced with MBID patients both during and after implementation. the origin of each requirement is stated in its specific section. The requirements are ranked in a MoSCoW order. This order prioritizes requirements by must have, should have, could have, and won't have.

2.1 Must have requirements

2.1.1 Readability

Text must be written at a basic level in order to be understandable for patients with MBID. Specifics have been obtained from the supervisor of this research and previous research describing guidelines for making accessible website content for users with intellectual disabilities [6][9]. Literature describes that text should consist of simple language and contain a spacing of 1.5 between sentences. Each sentence should not explain more than one idea at a time. Sentences should be short and direct, without the possibility of misinterpretation. The supervisor acknowledges these guidelines as well and in addition, stated that the language level should not exceed B2.

2.1.2 Reduced cognitive load

Due to adults with MBID having reduced cognitive abilities as described earlier in the introduction, the web interface must reduce cognitive load [11]. This is achieved by limiting the amount of information per webpage that the patient views as well as limiting the number of options the webpage has to navigate. The interface must be a minimalistic design that avoids unnecessary information or options other than the required goal of each specific webpage. This is done by applying Gestalt-Principles [7]. These principles indicate that similar-looking text should be close to each other, and directions should be made so that they stand out from other text on the same page.

2.1.3 Intuitive

Navigating through the web pages should be intuitive. According to multiple interviewees, most patients have a mobile phone and can navigate successfully to use common apps. The user interface can be made intuitive by making use of common interfaces, such as the use of smiley faces, slider boxes, and check-mark boxes since these are interfaces that the user group has a lot of experience with. The user interface should be made intuitive partly by adapting these common interface types to ensure that patients with MBID can use the prototype independently. Interviewees stated the necessity and examples described in this requirement during the evaluation of the prototype.

2.2 Should have requirements

2.2.1 Consistency

Previous guidelines for creating accessible web content for patients with MBID showed that choice of words within the text should also be made consistent, along with being on a basic level discussed in the readability requirement [6][9]. Evaluation of the prototype showed that inconsistency of word choice can lead to confusion of the meaning of words. Therefore, synonyms should be avoided and important terms should be repeated using the same term.

2.2.2 Clarity of words

Interviews with representatives of Tactus showed that text is often interpreted literally and patients with MBID struggle to comprehend figurative speech, which introduced this

requirement. Interviewees suggested that speech and double meanings should be avoided. Referring words should be direct and literal. This requirement could also be stated as a must have priority, but practice showed that eliminating all possible multiple-meaning words and synonyms remains challenging. Some of these were still found after multiple iterations with experts and using text that accommodates people with MBID.

2.2.3 Multiplatform accessible

Interviewing a web developer of Tactus revealed that 80-90% of patients at Tactus use the online web modules on their mobile phones. Therefore, the prototype should be multiplatform so that it is available to both computer and mobile users.

2.2.4 Visuals

Research has shown that using visuals to assist text yields positive results when lecturing people with MBID [4]. Images, animations, or videos should be added to support the text. Adding visuals distributes the cognitive load of the web page to eyes and ears so that the user can see what is explained in the text. Visualizing information within the web page reduces the cognitive load of users since having merely text would require the user to visualize with their own brain.

2.3 Could have requirements

2.3.1 Easily accessible content

Navigating to the correct website and logging in can be a difficult task on its own for patients with MBID. Both Tactus employees interviewed during the evaluation of the prototype mentioned that if logging in was required with a specific account and a website link would be long and unclear, most patients with MBID would already lose focus and give up. The interviews derived this requirement that web content for patients with MBID should be easily accessible. This means that navigating to the required web module requires as few steps as possible.

2.3.2 Guidance

Preferably the user interface should be intuitive such that no remarks are required to clarify its intention. However, if possible confusion can not be avoided, and navigating tasks/highlighting tasks can't be signaled subconsciously, then the user can be guided through the page by adding tips that describe how to navigate through the interface. These steps make the intention explicit and direct, which is also one of the guidelines described in previous research [9].

2.3.3 Error recovery

Users can click somewhere without their intention or by confusion causing them to exit the web module unintentionally. This was the case during one of the evaluations of the prototype with an interviewee. The interviewee suggested that the likelihood of this scenario should be reduced by limiting the user's options to navigate within the user interface. When this scenario is unavoidable the interface could warn users that their action is going to move them outside of the web module, verifying that this is indeed the user's intention.

2.3.4 Adjustable

As shown in literature and derived from evaluating the prototype with Tactus employees, the treatment of patients can differ depending on an individual basis [2]. Individuals can require different types of treatment. Patients with MBID can also prefer different approaches individually to online treatment. For example, some patients could prefer reading while others prefer watching videos. The web module could be adjustable so that therapists can alter the module to be more accommodating on an individual basis of their patients.

2.4 Won't have requirements

2.4.1 Sound support

Past research has shown that audio cues can increase the effectiveness of converting information to people with MBID [3]. Voice translation can be added to the user interface to accommodate this group. A voice icon can be added that plays an audio translation of the text on each screen. This option will not be part of my prototype because of time constraints, as recording separate voice files for each screen is a time-consuming task.

2.4.2 Video Content

Videos are part of visuals which is described as a should have requirement. Past research has shown effective use of video content to lecture people with MBID [13][14]. However, due to time constraints, custom videos and animations will not be a part of this prototype.

2.4.3 Personal feedback

An interviewee suggested that the prototype can offer personal feedback to patients by asking questions to patients concerning their addiction. This makes the prototype a better tool for personal therapy. Since giving therapy is outside of the scope of this research, meaning no personal questions or feedback will be added.

3. EXISTING MODULES

As has been stated before briefly, the current Tactus web modules on Minddistrict are not suitable for patients with MBID. Within this section, the current modules are analyzed using the derived design requirements. Additionally, limitations of Minddistrict are stated that limit the application of some requirements.

Figure 1 shows a typical web page that is part of one of the Tactus web modules called "Verslaving de baas" [1]. Referring back to the stated design requirements for the prototype in section 2 we can see that the current system does not satisfy these requirements.

In terms of readability, there is too much text on one page. The text is not properly spaced and small font size. Words used are not short and basic enough to be understood for patients with MBID. Multiple topics are addressed in the same section. Each web page contains information, advice, and questions to patients on the same page. This in turn requires the patient to learn information, apply that to themselves and reflect on their

Figure 1. Webpage of one of Tactus' current modules

behavior on the same page. This does not satisfy the reduced cognitive load.
Finally, the webpage does not seem to be intuitive. The relevance of the added image to the information is hard to understand. The subtitle "Lichamelijk" (physical) does not appear above the text. The goal of the webpage is hard to determine without reading all of the text.
The existing web modules fail to satisfy the must have stated requirements already, and are thus not well suited for patients with MBID. The prototype is a module made in the same environment of Minddistrict that aims to satisfy at least these requirements and optimally all of the stated requirements covered in section 2.

3.1 Limitations of Minddistrict

The creation of new online modules within Minddistrict is a user-friendly task but at the same time limits the creator heavily on design options. Some of these limitations are in conflict with the stated design requirements in order to make a suitable module for patients with MBID. This section provides a list of limiting functions within Minddistrict and explains design requirements that could not be met partly or entirely as a result of that.

3.1.1 Static font size

The font within Minddistrict modules cannot be altered, nor can the font size. The default size of words is small and may not be visible enough for patients with MBID. This conflicts with the Readability requirement.

3.1.2 Navigating within modules

Navigating through web pages within a module on Minddistrict is done by a blue proceed button to proceed to the next page, and a small header on top of the page to return. Making these actions more visible or at a different position on the web page is not possible. This is in conflict with the Intuitive requirement.

3.1.3 Structure of sections

Some sections within Minddistrict have static titles. These static titles do not satisfy the Readability requirement as they contain difficult words. The feedback is structured in such a way that patients need to confirm their answers twice, which involves scrolling through the same page multiple times. This is not adjustable and conflicts with the Intuitive requirement.

3.1.4 Position of text and visual content

Text boxes and visual content are displayed in a top to bottom order in the Minddistrict environment. This means that supporting images can not be displayed next to the text, only above or below the text. Due to the short size of each webpage, this requires the user to scroll down to view the rest of the page, which does not satisfy the Intuitive requirement. By not being able to see both the relevant picture and text, the Cognitive load requirement is not satisfied since users have to view these separately and link them together.

3.1.5 Not supporting interactive visuals

The Minddistrict environment does not support interactive visuals. This prevents interactive menus from being implemented which could filter information in a sophisticated way. For instance by displaying relevant information when part of a picture is hovered by the user. Such methods could help reduce cognitive load.

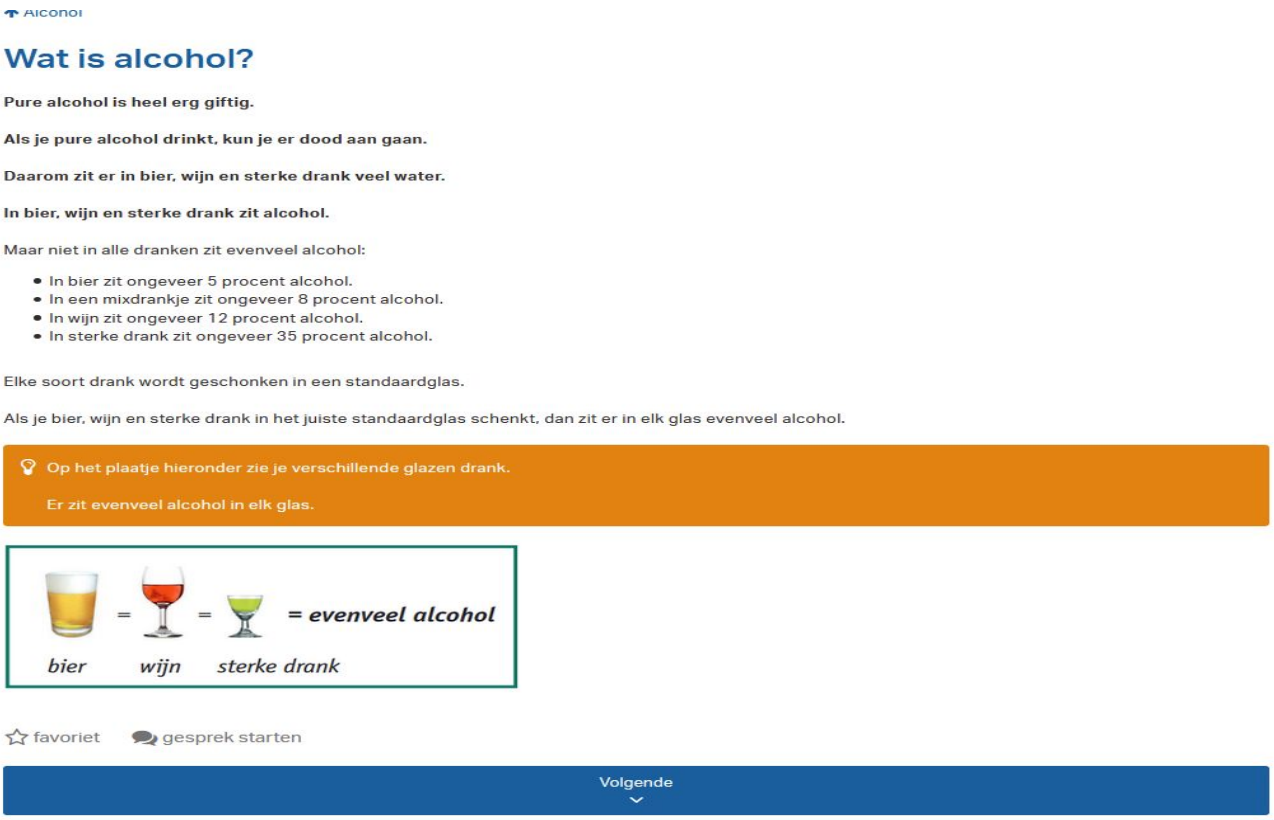

Figure 2. Webpage of the prototype

4. PROTOTYPE

The prototype is implemented in the same environment as that of Tactus' modules, namely in the Minddistrict content environment. This content environment is an HTML based website in which companies like Tactus can develop e-health in a user-friendly way. In order to fully understand the Minddistrict content environment and to be able to implement the prototype, an interview has been conducted with a content creator of Tactus. Within this interview, the limitations and functionalities of the Minddistrict environment as described in section 3 have been explored and verified.

4.1 Content of the prototype

The textual content of the prototype is general information about alcohol aimed towards young adults with MBID. This text alongside some images is derived from a flyer called "Alcohol zonder flauwekul", made by Trimbos [12]. The decision to opt for existing materials rather than create new material was made because this prototype is designed to research how to present addiction treatment to patients with MBID. Therefore, this research focuses on adapting existing materials. However, the modules within Tactus' environment proved to be too broad and personal to convert into a prototype for this research.

The final version of the prototype is made to be suitable for a usability test with patients with MBID that covers between 30-45 minutes. The prototype consists of an opening screen that describes the module and its content to participants, followed by information on different alcoholic drinks and how alcohol is digested in the body. Figure 2 shows a web page of the prototype which displays information on different alcoholic drinks. Afterward, the module contains three theory questions to test the user's understanding of the text. The last page contains a satisfaction questionnaire giving users the opportunity to express their agreement or disagreement for ten statements, an English translation of this questionnaire can be found in figure 3.

1. I would like to use this website in the future to learn more about addiction
2. I was able to read the text clearly.
3. It is easy to navigate through this website.
4. It is fun to be on this website.
5. The images helped me understand the text.
6. I learned something from this.
7. The questions were difficult.
8. There was a lot of text.
9. I understand easily what I am supposed to do.
10. The website is boring.

All statements ran from *definitely disagree (1)* to *definitely agree (5)*.

Figure 3. Satisfaction questionnaire

4.2 Structure of the prototype

Compared to existing modules of Tactus on Minddistrict, the prototype contains alterations made to make it more suited for patients with MBID. These alterations can be linked to the previously stated design requirements in section 2. Starting with the must-have requirements, Readability is achieved by applying Trimbos' flyer text [12] and summarizing important information in bold font. To satisfy the requirement of Reduced cognitive load, the amount of text per page is limited and spacing is added between sentences. Information, questions, and reflections are separated over multiple webpages. As mentioned in the Limitations of Minddistrict, the existing Minddistrict modules are not intuitive and this structure is static. This issue is partly solved by applying stated requirement guidance: The first web page describes how to navigate through the module and highlights important functions for that, such as the blue "Volgende" button which can also be seen in figure 2, as well as the function of scrolling if a page exceeds a certain length. The should-have requirements Clarity of words and Consistency are validated through using the use of Trimbos' flyer text [12] and the evaluation of the prototype, which is further specified in the next section. Minddistrict's modules are automatically compatible with both computer and mobile phones, satisfying the Multiplatform accessibility requirement. Visuals have been added to reduce cognitive load, only when these have a clear relation to the text and are easy to interpret.

Out of the could-have requirements, only Guidance has been applied as explained to combat the lack of intuitively. Error recovery and Easily accessible content cannot be incorporated due to Minddistrict's limitations discussed before. The prototype can satisfy the requirement Adjustable, as pages are easily editable within Minddistrict's environment, although the content has not been adjusted within this prototype due to the professional nature of designing effective therapy being outside the field of this research

5. VERIFICATION

The prototype has been verified by conducting both user usability tests and interviews, as similar observations between multiple research methods give further validation to research findings [8].

5.1 Participants

Two Tactus employees participated and the involved supervisor. Both the Tactus employees and supervisor have a lot of experience with patients with MBID. Both Tactus employees did the user usability tests by performing as MBID patients, to cover the patient perspective. Afterward, the Tactus employees gave their input during the interview as therapists.

5.2 Procedure

Firstly, participants were introduced to the aim of the research and a general overview of the prototype was given. User usability tests consisted of patients independently navigating through the prototype. The usability tests include filling out the satisfaction questionnaire in Figure 3. After usability tests followed a semi-structured interview to discuss whether the participants agreed on the prototype meets the requirements and whether they had any additional ideas to add. The topics that were discussed are summarized in figure 4.

1. What is your role within Tactus?
2. Do you have a lot of experience with MBID patients?
3. Do you have any experience with online modules?
4. Do you think this prototype is suitable for patients with MBID?
5. Do you think online modules can be a suitable contribution to addiction treatment for patients with MBID?
6. Do you suggest any modifications or additions to this prototype?

Figure 4. Interview questions

5.3 Findings

All respondents were found to have similar answers to the first four questions. Regarding the first and second questions, participants all answered that their role within Tactus is to provide and design effective therapy to patients with MBID and have multiple years of experience in that field. All participants had no or barely any experience regarding online modules, only the recent shift to online therapy through applications such as Microsoft Teams was stated due to Covid regulations. All participants reacted positively to the suitability of this prototype for patients with MBID, provided that the content is revised based on their feedback. Answers to questions five and six are elaborated in the sections below.

5.3.1 Content

Participants agreed that the Readability requirement is satisfied. According to both employees, the word size is not too small and the web pages have proper spacing and amount of information per sentence. The reduced cognitive load of the prototype had mixed opinions. The prototype was deemed too lengthy based on the amount of information by an evaluation with the supervisor. After revising the prototype the Tactus employees gave mixed opinions. One thought the prototype could contain more information while the other thought it should contain less. Additional remarks from all participants regarding the text were made to make it more consistent and clear, these changes have been implemented in the revised prototype. Examples of some of these changes were simplifying language, removing unnecessary information, and using consistent terms throughout the prototype.

5.3.2 Navigation

Navigating through the page was deemed Intuitive by all participants. Accessing the module through Minddistrict however was difficult for all participants, which means the prototype is not easily accessible.

Other suggestions to improve the prototype were not possible to implement due to described limitations of the Minddistrict environment. Examples of suggestions are the use of animated pictures, positioning the image next to the text, and adjusting the way of navigating through the module.

5.3.3 Additional remarks

An additional remark made by both Tactus employees was that the amount of information should be carefully considered when considering patients with MBID. Some topics such as how alcohol is processed in the body may be too difficult. Because of the short attention span of this user group, it should be carefully considered what information is important and easy enough to understand. Both participants also mentioned that a lot of those dilemmas have different answers on an individual basis. This shows that the type of information and the usefulness of that information to patients with MBID should be carefully considered and aimed to accommodate as many patients as possible.

6. CONCLUSIONS

The prototype designed within this research was made to research the possibility of making suitable online addiction treatment modules for patients with MBID in the Minddistrict environment. Implementing and evaluating said prototype resulted in a set of design requirements that describe how online modules can be suitable for patients with MBID. Participants of the research agreed that the resulting prototype was suited for patients with MBID. Remarks about possible improvements that could not be implemented in the prototype due to Minddistrict's environment restrictions have been listed for possible future improvements.

6.1 How can text be written in such a way that it is readable for patients with MBID?

Text can be written in such a way that it is readable for patients with MBID following arguments in the Readability requirement specified in section 2. Text should consist of simple language not exceeding the language level of B2 and contain a spacing of 1.5 between sentences. Each sentence should not explain more than one idea at a time. Sentences should be short and direct, without the possibility of misinterpretation. Definitions should be consistent and the choice of words should be clear in order to avoid the possibility of multiple interpretations. Verification of the prototype has shown that making readable text for patients with MBID can require multiple iterations.

6.2 How can the user interface of a webpage be adapted so that information is perceived easily by patients with MBID?

By limiting the amount of information per web page, information can be perceived easily by patients with MBID. Additional information should be added through new web pages. Web pages should filter information as much as possible by separating multiple concepts while providing enough information to explain each concept and its relation. This can be achieved through visual content and menus that display information in a step by step process. Navigation through a web page should be intuitive and self-explanatory. The prototype verified that filtering information over multiple web pages can ease the understanding of patients with MBID. Explicitly stating how users can navigate through the module was deemed positively during evaluation as well.

6.3 How can the addiction treatment modules of Tactus be adjusted so that it supports patients with MBID?

Accessing a web page should contain as few steps as possible, the use of a login screen may already include too many steps. The addiction treatment modules of Tactus can be adjusted so that it supports patients with MBID by satisfying the design requirements that have been derived from the evaluation of the prototype. All derived requirements are listed in order of the MoSCoW prioritization followed by which of those can be implemented by adjusting Tactus' modules within Minddistrict.

The web module must satisfy the requirements of readability, intuitively, and reduced cognitive load. The prototype showed that readability can be achieved by iterating the textual content with professionals. Minddistrict's environment showed limitations in achieving intuitive and reduced cognitive load in modules of Tactus due to the static position of content and structure, this is partly solved by adding explicit instructions on how to navigate.

Text should be written consistent and clear, without the possibility for multiple interpretations. Text should be supported by visuals to balance the cognitive load of the user. Web modules should be supported on multiple platforms. Verification showed that all of these requirements can be achieved in Tactus' modules. Visuals can only partly support text due to their static position below or above text.

Finally, modules could be easily accessible, guide the user through navigating in a module and prevent possible errors made by the user. Modules could be easily adjustable so that they become more personalized depending on the patient. Within Minddistrict's environment only guiding the user through the navigation and adjusting the content of a module is possible.

7. DISCUSSION

The list of design requirements derived from this research may be incomplete and is not fully verified due to the lack of several factors. This section aims to list the most apparent missing factors and describe their relevance, namely the lack of MBID patients and the lack of personal content. It suggests future work that can include the missing factors.

7.1 Lack of evaluation with MBID patients

Although the therapists participating in the evaluation of this prototype were experienced with patients with MBID and able to view the prototype from that perspective, this research does not include testing with its end users: patients with MBID. Therapists can give insightful feedback due to their experience with multiple MBID patients. Due to the broadness of this target group, the feedback given by therapists can be seen as a summary of collective interest from the target group. However, evaluating the prototype with actual patients with MBID can result in feedback that therapists did not consider. This feedback can lead to additional requirements or a different prioritization of the existing requirements.

Additionally, evaluating the prototype with MBID patients provides stronger evidence for the verification of the listed

requirements. The prototype contains theoretical questions to test the user's understanding of the prototype's content. These questions have not been used to verify the understanding of users during the evaluation since the evaluation only involved therapists. By including actual patients with MBID, the correctness of these questions can be analyzed and used to verify the correct understanding of the prototype's content.

7.2 Lack of personal content

As described previously in the section prototype (4.1), this prototype does not contain personal questions or feedback. This means that the content of this prototype is mostly catered towards providing general information. During the evaluation, both therapists mentioned that the approach of therapy can differ greatly on an individual basis based on the preference and suitability of the patient. Modules can also include for instance advice or describe real-life scenarios, as seen in existing Tactus' modules. Including personal content and feedback can once again require additional requirements or a different prioritization of existing requirements.

7.3 Future work

Future work should verify the stated MoSCoW priority and completeness of the derived design requirements within this research by testing the prototype with its end-users, MBID patients.

Furthermore, a multidisciplinary collaboration of therapists and computer scientists could design a module that both incorporates the stated design requirements in this paper and offers personal content such as advice or real-life scenarios. Evaluating such a prototype could lead to interesting findings, concerning the type of content and preference of the target group. Results could answer the question of whether patients with MBID have different preferences on the display of information based on the type of content.

Finally, possibilities outside of the Minddistrict environment should be considered, so that the restrictions of its environment no longer apply. Different menus and interfaces can be explored that distribute information over a web page more elegantly, for instance with supporting animated pictures and interactive menus. Such findings could provide a more elaborate answer to the research question of how the user interface of a webpage can be adapted so that information is perceived easily by patients with MBID.

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