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Participatory Research with Youth for Responsible AI in the Netherlands: The Perspective and Design Requirements of Youth from Diverse Backgrounds for an AI-Based Digital Mental Health App

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Artificial intelligence (AI) based mental health apps, especially chatbots, are increasingly being developed for youth, but rarely with their input, especially that of marginalised groups. This results in the development of apps that have low engagement and pose safety concerns. We use participatory methods to explore the preferences and design requirements of youth who face social exclusion, come from migrant backgrounds, or have low socioeconomic positions. We recruited 64 youths from youth work programs around the Netherlands and carried out 6 workshops. The first three explored the use of apps and large language models (LLMs) for well-being, while the last explored youth's preferences for an LLM chatbot. Data was analysed thematically. Our results showed participants were open to using apps, preferring multifunctional apps, and identified human connection, self-development, and education as potential functions. However, they were reluctant to use chatbots, perceiving them as fake and lacking emotional intelligence. Instead, participants saw chatbots as providers of information, favouring

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shorter outputs with simple language, although they disagreed on how human-like chatbots should sound. Finally, the need for personalisation was emphasised, showing a desire for control with extensive customisation settings and clear privacy policies. Further work must be done to explore other relevant stakeholders' views.

CCS Concepts: • **Human-centered computing** → **User studies**;

Additional Key Words and Phrases: participatory design

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1 Introduction

As society becomes ever more complex, so do the challenges faced by youth (adolescents and young adults aged 12–23). Climate anxiety, social media induced identity crises, academic performance pressure, and increasing social inequality have contributed to a rise in mental health challenges [1, 2]. Adolescence and young adulthood are periods of change and vulnerability, with epidemiological research showing most mental health conditions appear by the age of 25 [3]. Globally, around 1 in 7 youths suffer from psychological problems [4]. Similarly, the prevalence rates in the Netherlands in 2023 were around 27% [5], and suicide was found to be the leading cause of death among youth in 2024 [6]. Meanwhile, mental healthcare systems are overburdened with insufficient workers and ever-growing waiting lists [7, 8].

However, **digital mental health interventions (DMHIs)** offer a promising solution. DMHIs include apps, websites and text messaging interventions which can prevent, educate about or treat mental health conditions [9]. They offer multiple advantages for youth, including accessibility, due to the ubiquitous use of phones; empowerment, as users can take control of their own health; and anonymity, to protect those with safety concerns [10, 11]. Recently, AI-based apps, a specific class of DMHIs, have gained popularity, especially conversational AI. These systems can be used for diagnosis, content delivery, and symptom management [12]. They leverage **large language models (LLMs)** to generate dynamic responses based on a conceptual understanding of text, producing conversations which flow naturally. For example, the mental health chatbots 'Yana'¹, Earkick AI², Abby³, and WHO's health assistant 'S.A.R.A.H.'⁴ all use these models. Nevertheless, recent research shows that adolescents are using 'general purpose' LLMs, which are not specifically designed for health or emotional support. A survey in the UK found 64% of teens use AI chatbots, with almost a quarter (23%) using them to seek advice [13]. Similarly, in the US, 72% of 13–17 year olds use an AI companion, with over a quarter (33%) using them for social interaction and relationships, including 12% for mental health [14].

While DMHIs could help soften the youth mental health crisis, they need to align with the needs and requirements of young people to be used, effectively and safely. However, retention rates for mental health apps are currently low, with one study showing an 80% decrease in app use over the first 10 days following download [15]. Meanwhile, the evidence of chatbots' effectiveness is mixed [16–18] with inconclusive results in studies on youth [19]. Moreover, LLM-based chatbots present unique risks. Youth are more likely to personify them, leading to a false sense of trust and security [20], and sensitive data may be shared, sold or used by powerful companies to make a profit [21]. Algorithms can also be opaque with unknown 'thought processes' leading to unpredictable

¹Link to webpage: <https://www.yana.ai/>.

²Link to webpage: <https://earkick.com/>.

³Link to webpage: <https://abby.gg/>.

⁴Link to webpage: <https://www.who.int/campaigns/s-a-r-a-h>.

responses [22]. This can lead to chatbots that endorse harmful behaviours [23] and exacerbate mental health emergencies in high-risk situations [18], with links already being made between generative AI and child suicides [24]. If designed without considering all of these risks, the use of LLM-based chatbots may simply increase the problems they aim to prevent [25]. These issues must be tackled before DMHIs can help bridge mental healthcare gaps.

The development of DMHIs for young people usually takes place without them, in academic or industry settings. However, emerging evidence shows that developing DMHIs with the input of key stakeholders, particularly young people themselves, can improve the acceptance, efficacy and safety of these tools. Participatory design and co-creation are methods that involve end users, psychiatrists, ethicists and technologists in the research and development of technological solutions [26, 27]. Their inclusion allows the redistribution of power in development and integrates lived experience into the design process to collaboratively shape what DMHIs look like. This can lead to more culturally aware and adapted solutions that better target communities' needs without imposing colonial categories on them or increasing stigma [28]. Participatory and co-creation practices result in better usability [29], more beneficial interventions [30], and a more ethically robust system overall [31]. In addition, these methods work to empower youth, who gain both personal and professional skills during the process [32].

Recently, some researchers have started working with youth to uncover design requirements for AI-based DMHIs. For example, Poulsen et al. carry out a co-design workshop for their Mental Health Intelligence Agent 'Mia'⁵ [33]. However, they integrate youths' perspectives later in the development process to determine the final design and implementation requirements. This is common in digital health studies, which tend to include users in the final testing stages, obtaining feedback on the design, content, effectiveness and acceptability [34]. However, users' perspectives are vital from the start as they are the experts in what they need, what they want and what they will use. Therefore, they should be included in the initial 'needs assessment' stage. Moreover, few studies work to co-create AI with youth specifically [35].

Importantly, studies which involve youth in the development of DMHIs lack diversity, equity and inclusion considerations, with little involvement of youth from diverse backgrounds [36]. Instead, end-users are usually treated as a homogeneous group [37]. DMHIs, which are often for pay, only available in English, or lack accessibility features, are rendered obsolete to some populations [38]. These design choices show a lack of consideration for marginalised groups who already face barriers to healthcare [39]. The lack of input from diverse populations can create more inequalities, entrench existing biases and lead to models which perpetuate existing stereotypes and control world narratives [27-40]. For example, LLMs may perpetuate gender or racial biases [41]. Marginalised groups are likely to have specific preferences and needs that do not necessarily align with the population at large. Therefore, including diverse youth helps increase their understanding of these technologies, provides researchers with novel perspectives, and helps create shared and acceptable technological visions [42].

Despite the rise of apps for mental healthcare and LLM-based chatbots, there is currently a gap in the research and design of these tools with and for youth from marginalised backgrounds, specifically in the earlier stages of app development. We aim to use participatory methods to inform the design requirements of AI-based digital mental health apps by exploring how these apps can support youth from marginalised backgrounds and what youths' preferences for these apps are. We focus on youth who face social exclusion, are from migrant backgrounds or have low socioeconomic positions. Specifically, we will target participants of youth work programmes in which the youth receive support and guidance from youth workers to overcome issues at school or at home. This is novel as qualitative research on the opinions of youth, especially those from marginalised backgrounds, on generative AI apps for mental health is lacking. Additionally, we use intersectional feminist theory to frame our research; its principles call for amplifying the voices of diverse and marginalised communities and challenging power asymmetries for meaningful inclusion. Finally, we carry out this research early in the development process to inform design requirements, as opposed to including end-users in later stages of development. These design requirements should inform the future development of generative AI apps for youth mental health.

⁵<https://miahealth.com.au/>.

2 Background Intersectional Feminism

Our work is guided by intersectional feminism. We view the problem with technology development as one of power distribution, where some have the privilege of developing technology for others. Intersectional feminism is a critical theory that recognises that dimensions of power intersect, where different forms of power, and therefore oppression, can have an additive effect. It is a theory that seeks to understand how oppression is experienced at different intersections, stressing that no one identity category is more important than the other, while pushing for social justice. In health research, intersectionality is increasingly used to promote reflexivity, challenge mainstream research paradigms, and highlight the importance of lived experience as a source of knowledge [44,45].

Using intersectional feminism as a guiding framework for digital health research pushes researchers to question the power asymmetries in the design and development of technology and find ways to redistribute and balance power [46]. Often, this results in some form of citizen engagement. Importantly, minimising tokenistic and paternalistic practices while striving for meaningful engagement through relationship building, trust and respect [47]. Above all, intersectional research promotes reflexivity by facilitating different questions which allow one to critically examine their own beliefs, biases and motivations. Therefore, there is no one-size-fits-all but a myriad of ways to carry out this research, with different paradigms depending on the specific project at hand [48].

We will use Abrams et al. 'Considerations for Employing Intersectionality in Qualitative Health Research' [49], an adaptable guide which provides extensive examples and recommendations of best practices. These recommendations have been translated into a project-specific checklist, which has been determined based on our specific research question, aims, scope, timeline and capacity (see Table 1). We will focus on attending to our identity and the identity of our participants during the conceptualisation phase; exploring non-traditional methods of participant recruitment, data collection and analysis; and employing reflexive practices throughout. Our target participants are young people who are usually left out of participatory activities due to their age, background and the social positions in society. In order to incentivise effective engagement, we will invest in relationship building by meeting our participants in advance, run the sessions in the youth spaces they feel comfortable in, provide snacks, employ youth-friendly creative methods, take breaks and tailor the energisers and icebreakers to each group [50].

We expect to find unique mental well-being contributors, an emphasis on the impact of religion and a desire for interactive activities. Meanwhile, we are curious about youths' opinions on apps and chatbots, expecting them to be in favour of using these technologies, as groups that face social exclusion tend to seek refuge on their phones [51]. Our approach is unique, as most literature does not combine the methods of intersectionality and participatory research to develop design requirements for an AI-based digital mental health app. We have already obtained ethical approval from the Human Research Ethics Committee at TU Delft (application number 4626) and will follow standard ethical human research practices throughout.

3 Methods

3.1 Conceptualisation

Over the course of two meetings, we shared information about ourselves and reflected upon the potential biases that could appear. Here is an aggregated summary positionality statement which describes the positionality of the eight core team members (NO, SD, RZ, KG, CF, NC, DG, KR).

Our motivation for conducting this research is clear. We are all passionate about social justice and believe that a person's identity influences their health and well-being. Additionally, we want to participate in projects that work closely with communities and have a positive, long-lasting impact on them. We identify as eight able-bodied, cisgender women with diverse backgrounds, nationalities, religious beliefs, and sexual orientations. Therefore, we have both an insider and an outsider perspective. Some of our backgrounds and journeys are similar to those of our target group, as we have faced social exclusion and been 'othered' by the people around us, mainly because of our migration backgrounds. Nevertheless, we now all hold positions of privilege and power as we have university

Table 1. Intersectionality Principle-Based Recommendations Per Research Stage

Stage	Recommendation
Conceptualisation	Reflect on the identities of the researchers involved, understand how these can influence the research and what biases could appear. Reduce the impact of identity on the research by building relationships with the participants. Recognise the power researchers hold in their position, aim to reduce this and create a more balanced power dynamic. Understand what forces impact the research topic. How do different forms of discrimination impact the mental health of our participants and the DHMIs they use?
Participant recruitment	Look outside of traditional recruitment sites to access intersectional marginalised identities. Employ different strategies to find those in the margins and combine these to reduce selection bias.
Data collection	Understand what forces impact the research topic. Are traditional research methods the most appropriate for this research?
Ethical concerns	To protect the participants, involve them in decision-making (where possible). Ensure participants are clearly informed and consent to participating in the study. Ensure the team is well-equipped with the knowledge and tools necessary.
Data analysis	Consider which type of analysis is most suitable for the research. Consider intersectional framings for the analysis: the effect of intersecting identities, context and historicity.
Throughout	Reflexivity, critically examining the influence of one's beliefs and assumptions on the research process.

Adapted from Abrams et al. [49].

degrees: four of us are pursuing Master's degrees, three are working towards a PhD, and our PI is an assistant professor. We have a wide range of expertise, including from the fields of medicine, psychology, biomedical sciences, political science, neuroscience, data science and design. While our academic backgrounds may incline us towards traditional methodologies, we plan to establish a youth board to consult throughout the process and to develop innovative methods and tools tailored to youth. Moreover, the diversity of expertise we hold, helps us view the research differently. Notably, our opinions about the use of apps and chatbots for mental health differ, which is advantageous as it will help us remain critical and decrease bias throughout the research. Our team is composed entirely of women, engaging with male participants may pose challenges. Therefore, we will include a male collaborator who can contribute to the design of the sessions to ensure a broader perspective and inclusivity. Finally, our ages range from the early 20s to early 30s, slightly older than most of our participants. This difference could create power dynamics that might make participants perceive us as authority figures, potentially hindering open dialogue. To address this, we will strive to connect more closely with participants, sit together whenever possible, and keep the sessions as informal as possible.

3.2 Participant Recruitment

We aimed to recruit youth (aged 12–23) who face social exclusion, come from migrant backgrounds or have low socioeconomic positions. Hence, we used venue-based sampling, targeting youth who participate in youth work programs in which they receive support and guidance to overcome issues at school or at home. Recruitment started in late April 2024. We created a social media account (Instagram) and met multiple youth workers at different events and gatherings. By September 2024, we had established relationships with multiple youth work organisations. The first, 'Talentenhub op Zuid', where young people from Rotterdam who are at risk of dropping out of school receive coaching to explore and encourage their purpose. Next, 'The Mall', a Christian neighbourhood centre in Delft, which carries out social work for those in need of help (e.g., with homework, taxes, finding jobs). Finally, 'Vitis Welzijn', an after-school program in Naaldwijk for girls facing social issues such as bullying.

Where possible, we organised introductory meetings to get to know the youth by talking, dancing and doing origami respectively. The aim was to build trust, reduce power imbalances and make them feel more comfortable. Compensation was discussed thoroughly in advance; we aimed to reimburse participants fairly for their time as well as give back something useful and valuable (key to intersectionality). Unable to give cash directly, we chose a 20-euro bol voucher (the Dutch Amazon equivalent).

3.3 Data Collection

3.3.1 Workshop Methods. The workshop content was developed collaboratively and iteratively: brainstorming, drafting, testing, improving, creating a presentation, re-testing and adapting throughout. The main goals, outlined in the research protocol [52], were refined as we realised our protocol was overambitious. Initially, we wanted to use the first workshop (of six) to understand the youths' perspectives on dealing with mental health challenges, AI, chatbots, how these should behave and how they can contribute to harm. However, we decided to split these topics into two workshops. The rest of the workshops mentioned in the protocol are now a part of separate studies, led by co-authors KG and RZ.

Once we refined the goals for the first workshop, our design master students contributed to developing appropriate co-creation activities. Next, we drafted a workshop protocol, designed the materials and tested the workshops on the whole team, including external collaborators. After integrating the team's feedback to make the content clearer, more continuous and effective, we worked on the presentation. Importantly, we tried to keep questions open to allow the youth to steer the conversation when they brought up new ideas. Based on the timeline, our availability and that of the participants, we planned to run three iterations of each workshop, allowing for improvements to be made between. Moreover, different icebreakers and energisers were adapted to the group in question.

The general structure of the workshops was as follows: an explanation of the goal, stressing the importance of our participants' contributions; acquiring informed consent from all participants (and the parents of those under 16); starting the recording and presenting and working on the exercises. We provided pens, papers and post-it notes as well as specific worksheets for different exercises. The workshop transcripts (text) were our primary data source, but we used participants' notes and drawings to back up what was being said and allow less talkative youths to express themselves freely [53].

3.3.2 Workshop 1. This first workshop investigated and validated previous findings on youths' opinions about digital mental health apps [54]. We discussed mental well-being contributors, educated them on LLMs, and looked into apps and AI as well-being contributors. To make information about LLMs more accessible to youth, we made an animated video⁶, using visuals to show how LLMs are trained on textual data and learn to recognise patterns to produce their own texts. The video created a shared understanding for the youth to share informed and meaningful opinions about LLM-based chatbots. Two exercises were used to explore apps and chatbots' possible contribution to mental well-being. The first is the ideal app exercise in which they could design or write about different app functionalities they found useful. For this, we provided a blank image of a phone. Secondly, the comic strip exercise, also using drawings and text, explored how a chatbot could help with or worsen a problem of participants' choice. We provided a comic strip of six squares, the first showing a sad person and the last showing a person who is either sad or happy, to find out what the chatbot could say or do in between to lead to this outcome. An exercise template can be found in the Supplementary Material, Workshop 1.

3.3.3 Workshop 2. The second workshop focused on how to fine-tune an LLM. Therefore, we presented the LLM video and an example health chatbot (the WHO's S.A.R.A.H⁷). Then, we used three different exercises to investigate the role of the LLM, what language it should use and how it should personalise content to the user.

⁶Link to video: <https://www.youtube.com/watch?v=PeIGwGefomo>.

⁷Link to S.A.R.A.H: <https://www.who.int/campaigns/s-a-r-a-h>.

Table 2. Mental Health Cases

Persona	Mental Well-Being Challenges	Output
Maria	Social anxiety	Maria is a 15-year-old girl who gets stressed in social situations. For example, she becomes anxious when she has to talk in class, she is afraid of what others might think of her accent. This causes Maria to skip school, often falling behind on homework. She also sees her friends less often, making her feel lonely. Maria suffers from negative thoughts about herself; she is afraid that others will find her weird.
Rami	Cultural identity	Rami is a 17-year-old boy who is half Moroccan. He struggles with his identity and understanding who he is. At home, he is encouraged to follow his family's traditions, but at school, he feels like he has to change to fit in with Dutch culture. This causes Rami to feel like he does not belong to any group and thus feels lonely.
Joost	Parental expectation	Joost is 16 years old, and he is a perfectionist and has always gotten high grades at school. His parents expect him to do well, and he feels a lot of pressure to meet their expectations. However, in recent months, Joost has felt gloomy and unmotivated. He sleeps poorly and has trouble concentrating.

The name given to each persona by the researchers, mental well-being challenge according to Kindertelefoon data; and modified ChatGPT output.

During the first two exercises, we presented the youth with some scenarios and example chatbot answers. We used ChatGPT to develop this content, the prompts are available in the Supplementary Material, Workshop 2. First, we prompted Chat GPT to develop three cases based on some common mental health challenges which were identified on the Kindertelefoon website (a Dutch mental health forum for youth). The three cases (of Maria, Joost and Rami) can be found in Table 2. Next, we prompted ChatGPT to respond to these cases. For exercise 1 (on the role of the LLM), the responses were based on the types of social support outlined in the '*Health Promotion in Health Care—Vital Theories and Research*' book [55]. We included 4 roles: the listener, the teacher, the motivator and the advisor. For exercise 2 (on the language of the LLM), the responses varied according to the four dimensions of tone of voice, developed by the Nielsen Norman Group [56]: formality, humour, respect and enthusiasm. Table 3 shows some examples of the chatbot responses which were shown to the youth, who discussed how their appropriateness and rated them accordingly. For the third exercise, we explored the tradeoffs between privacy and personalisation, using a Mentimeter with multiple questions to prompt conversations about the topic.

Each iteration of this second workshop resulted in slight changes to the protocol as we attempted to improve the exercise to obtain more valid results. After the first iteration, the youth were tired and confused, the workshop was too long, and they did not understand exercise 2, suggesting the content was too similar to that of exercise 1. Therefore, we added another break and modified the chatbot responses, making them shorter and more distinct. While this increased participants' understanding of the exercise, their effort was still minimal as their energy faded throughout. Hence, for the third iteration, we decided to increase their energy by getting them to act out the outputs while reading them. Unfortunately, this did not help in achieving better results as they copied each other's answers while voting for the best tone of voice. Finally, we decided to exclude the data from analysis and relied on verbal accounts throughout to draw any conclusions.

3.4 Data Analysis

The workshops were recorded and human-transcribed through a transcription agency Amberscript.ti, we used DeepL to translate the text, and SD checked the translations. We used Atlas.ti for the thematic analysis, employing an inductive approach according to Naeem et al. [57]. The images were then analysed deductively based on the results from the inductive analysis, while creating new codes where necessary. Two researchers (NO and SD)

Table 3. Example Responses—Role and Language Variations

Exercise	Type	Answer
1 (Role)	Listener	‘How annoying that you feel this way. I understand that being excluded affects your self-confidence. It’s normal to feel alone when your friends don’t include you. Have you talked to anyone about this?’
	Teacher	‘It sounds like you are feeling lonely. Loneliness is when you feel like you’re alone, even though you aren’t alone. It may be because you feel little real connection with others or feel misunderstood. This can make you feel very sad, angry or anxious’.
	Motivator	‘What you’re going through matters, even if it’s difficult. It makes you stronger and helps you cope better with difficult situations. We all feel alone sometimes’.
	Advisor	‘Start by making a list of your strengths and what you like about yourself. This will help you look at yourself more positively. Do you find it difficult? Then start small and build up slowly’.
2 (Language)	Formal, serious, respectful, matter-of-fact	‘Joost, I understand that the pressure of expectations can be a lot and it affects how you feel. It is important to see how you can give yourself some space and improve your mental happiness again’.
	Casual, funny, irreverent, enthusiastic	‘Joost, wow, those traits really are your superpower, but it sounds like your battery is dead. Time to slow down a bit and remember that no one has to be perfect!’
	Formal, serious, irreverent, enthusiastic	‘Joost, it sounds like that pressure has you grabbed by the throat, and that makes it hard to move forward. But you know what? This is exactly the time to put yourself first and find that balance again’.
	Casual, funny, respectful, matter-of-fact	‘Joost, that sounds spicy. Maybe it’s time to take a break and talk to someone about how to make the pressure less demanding. You don’t have to do this alone’.

An example chatbot output for four different roles answering the Maria scenario, and four different tones of voice answering Joost.

independently read the transcripts to familiarise themselves with the data, found relevant quotes according to the research objective and selected keywords which summarised the data. Then we developed codes and discussed our choices, resolving discrepancies with the rest of the research team (CF, KG, RZ, MR and NV) that helped settle unresolved conflicts. The themes were also developed independently to increase the reliability of the results, discussing our choices and identifying patterns together. Finally, NO developed a conceptual model, later refined with CF. Throughout the workshops, we spoke about mental well-being, apps and chatbots. Accordingly, during the thematic analysis, we divided the data into three categories based on these three topics. The results include 50 codes and 14 themes. Table 4 shows an example of the codebook.

4 Results

4.1 Participants

We ran four workshops at the Talenthub Op Zuid (Rotterdam), one at The Mall (Delft) and one at Vitis Wellzijn (Naaldwijk). Throughout these, we collected data from 64 participants, with missing data from 1 who only filled in half a demographics form and 12 who used an older version of the form, missing questions about health app use. We discarded data on education level as the question was formulated vaguely and not assessed reliably. However,

Table 4. Codebook

Categories	Themes	Codes	Instances
Mental well-being	Definition	Positive feelings	5
		Lack of negative feelings	7
	Contributors	Disconnecting	8
		Distracting activities	6
Mental well-being app	Social media	Social contact	10
		Used (social media apps)	8
		Entertainment	10
		Mixed opinions	4
	Ideal functionality	Multifunctional	9
		Entertainment	18
		Social function	10
		Information	19
		Financial support	5
		Personal goals	14
	Ideal characteristics	Personalization	8
		Accessibility	10
		Positive personality attributes	17
	Control through personalisation	Personalize language	7
		Personalize design	4
		Personalize to basic characteristics	9
		Personalize to personality	10
	Staying protected	Sensitive information not shared	3
		Safeguards for protection	16
		Illusion of consent	13
Chatbots	Limited usage	Familiar	12
		Practical	11
	Negative opinions	Lack emotional intelligence	5
		Technical limitations	10
		Don't want chatbot	5
		Humans over chatbots	10
	Positive chatbot outputs	Information/advice	8
		Contact	5
		Distracting with media	4
		Countering problem	12
		Money	2
		Confirmation	7
	Negative chatbot outputs	Unhelpful	12
		Acting badly	10
	Easy language	Natural	11
		Concise	12
		Consistent	4
	Useful outputs	No best outputs	8
		Provides specific advice	16
		Do more than observe	11
		Affirm feelings	3
		Encourage reflection	6
		Empower individual	23
		Avoid creating more doubt	5
		Relevant	2
	Positive characteristics	Positive	6

3 categories, 14 themes and 50 codes.

Table 5. Youths Baseline Characteristics

Characteristic	Categories	N (%)
Age (years)	10–15	24 (37.5%)
	16–19	35 (54.7%)
	20–23	5 (7.8%)
Gender identity (open answer)	Female	43 (67.2%)
	Male	20 (31.2%)
	Child	1 (1.6%)
Cultural identity (‡)	Dutch	38 (60%)
	Moroccan	9 (14.1%)
	Surinamese	7 (11%)
	Cape Verdeans	5 (7.8%)
	Portuguese	5 (7.8%)
Parents country of birth (‡)	Antillean	5 (7.8%)
	Netherlands	50 (39.1%)
	Marocco	16 (12.5%)
	Suriname	10 (7.8%)
	Cape Verde	9 (7.0%)
	Turkey	7 (5.4%)
	Curacao	6 (4.7%)
	Other	30 (23.4%)
Multilingual household	No	34 (53.1%)
	Yes	30 (46.9%)
Languages spoken (‡)	English	11 (17.2%)
	Arabic	7 (10.9%)
	Portuguese	3 (4.7%)
	Berber	3 (4.7%)
	Spanish	2 (3.1%)
	Papiamentto	2 (3.1%)
	Kurdish	2 (3.1%)
	Turkish	2 (3.1%)
	Undisclosed	3 (4.6%)
Household size (†)	1	2 (3.1%)
	2	9 (14.1%)
	3	15 (23.4%)
	4	15 (23.4%)
	5	15 (23.4%)
	6	4 (6.3%)
	10	1 (1.6%)
	Undisclosed	3 (4.6%)

Out of 64 participants, ‡Participants could write multiple answers, †Participants answered how many other individuals in their current household (besides themselves).

most youth were either engaged in vocational education or at risk of dropping out of school. Participants' ages ranged from 10 to 23 years, with a mean of 16.2. Their baseline characteristics, in Table 5, show 67.2% identify as female and 60% as Dutch, although 68.8% had a migration background. All participants have their own phone and 90.1% their own computer, while 63.5% have almost ubiquitous access to the internet via 4G or 5G, and only 17.5% rely on Wi-Fi (Table 6). This access is reflected in how often they are online, with 48% reporting they are connected multiple times a day and 52% almost all day. However, only 23.5% described currently using health apps, the main uses being sleeping, tracking their menstruation, or sports (Table 7).

Table 6. Accessibility Baseline Characteristics of Study Participants

Characteristic	Categories	N (%)
Devices	Personal phone	63 (100%)
	Personal computer	58 (90.1%)
	5G	30 (47.6%)
Internet access	4G	22 (34.9%)
	Home or school	10 (15.9%)
	Wherever there's WiFi	1 (1.6%)
Internet use	Almost all day	32 (52%)
	A few times a day	20 (48%)
	Prefer not to share	1 (1.5%)

Out of 63 participants.

Table 7. Use of Health Apps

Characteristic	Categories	N (%)
Use of health apps	No	33 (64.7%)
	Yes	12 (23.5%)
	I don't know	6 (11.7%)
Would they use an app for... (‡)	Healthy living	20 (39.2%)
	Dealing with daily stress	18 (35.2%)
	Dealing with anxiety	15 (29.4%)
	Sports	15 (29.4%)

Out of 51 participants, ‡ Participants could pick multiple answers.

Due to the length of the relationship-building activities, timing of recruitment and the youth's availability, different groups participated in each workshop. Each of workshop 1's three iterations was carried out with youth from the Talenthub. Meanwhile, for workshop 2, we ran each iteration with a different group. The Talenthub youth had a smaller age range and included males. The Mall and Vitis Wellzijn only included females, with the latter having fewer youths with a migration background. However, we did not observe any between-group differences with similar codes appearing in each iteration.

4.2 Opinions about Apps and Chatbots

When talking about health apps, the youth suggested healthy living, exercising or dealing with daily stress and anxiety as potential functions. Meanwhile, they were open to the idea of using these mental well-being apps, although some rejected the idea completely, saying an app would never work for them, '*because it's an app*'. We collected a total of 23 worksheets for the ideal app exercise (workshop 1). The participants used these worksheets to express themselves in different ways, with 6 youths drawing a detailed image, 8 drawing some icons with descriptions, 8 writing a detailed explanation of their ideas and 1 simply stating that a telephone cannot help. Interestingly, over half of them included multiple functions in their app, showing a preference for multifunctional apps which allow them to engage with different topics and activities. For example, Figure 1 shows the drawing of an app with sections for media recommendations, specific health information and anger. Many included the icons of existing apps, especially social media (Figure 2). Importantly, they stressed the app should be accessible to all. For example, they mentioned the app should be free of charge and for everyone, with accessible language, easy words and short texts. The functional and non-functional preferences for a mental well-being app are summarised in Table A1 in Appendix A. For the functional requirements, the youth included things such as having a habit tracker, obtaining information about different issues or receiving media recommendations.

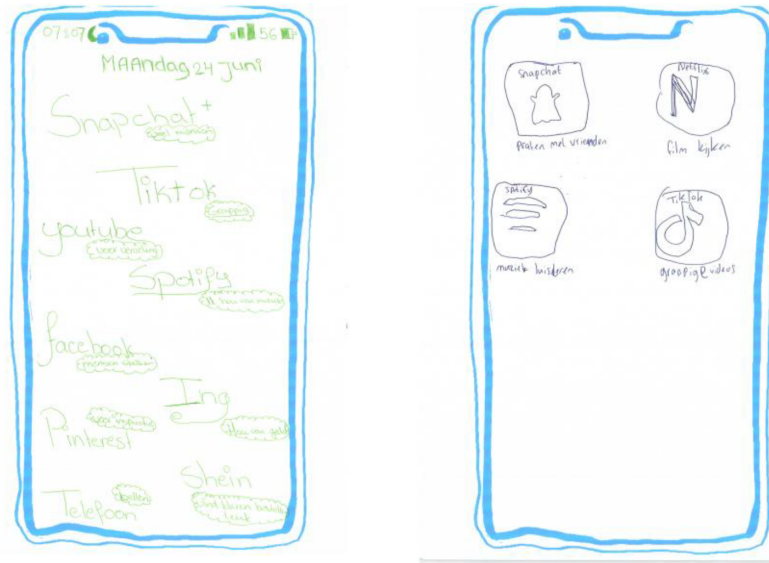


Fig. 1. Popular social media apps.

Meanwhile, the non-functional requirements revolved around personalisation, such as having a personal profile, and accessibility, such as including a magnifying glass for reading.

The youth reported using social media, including apps like Snapchat or TikTok, for their mental well-being. While they recognised that social media is not designed for that purpose, they use the apps to get distracted and avoid negative emotions. For example, many of them described watching memes, reels and games, which make them feel better by keeping them entertained. Additionally, some participants mentioned how certain content could influence them. For example, one participant mentioned that watching street fights on social media improved their mood by modelling healthy behaviours which they could imitate and learn from, such as being 'sportsman-like'. Despite this, the youth also recognised social media's limitations: *'It can help, but it can also work against [mental health], so a bit of both sides'*. Therefore, while social media is used, it is not the ideal solution with both the capacity to help and worsen a situation.

Likewise, regarding chatbots, the youth saw both benefits and disadvantages. The youth were familiar with the technology due to its widespread integration across mainstream services. For example, some individuals had experience using ChatGPT and other AI-based tools, which were viewed as practical tools for finding information. *'It's a robot that supposedly knows more than Google'*. They were seen as accessible tools which can be relied on for specific tasks such as fact-checking, doing calculations, writing reports or checking tests. *'If I have a discussion with someone and I'm going to ask [ChatGPT] a question about whether it's true, it's going to completely explain why it's true and so on'*. However, participants did not describe verifying chatbot outputs and had little awareness of the potentially biased information it can provide.

On the other hand, participants described myAI, a mandatory update introduced by Snapchat. *'You can't remove it until you start paying for the app'*. Here, they saw the technology as an inconvenience as opposed to a useful addition to the app. Therefore, they reported not interacting with it in depth. *'No, I think [I used it] when it just came up, it was fun, but after that, never'*. Reasons for not using chatbots included their sometimes-inaccessible language and lack of emotional intelligence, making them unhelpful and at times annoying. For example, the youth described customer service chatbots which do not emote or react like human beings, *'[It] doesn't stop when I tell [it] to, [it] goes on and on'*.

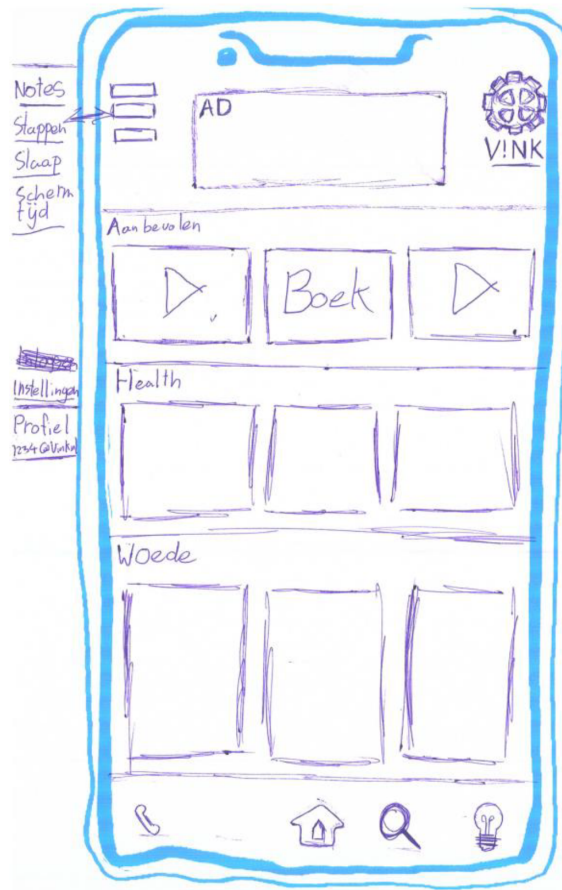


Fig. 2. Multifunctional app (ideal app drawing exercise).

Meanwhile, when it comes to using chatbots for mental well-being, most rejected the idea of it being helpful, adding that they would prefer to talk to people as opposed to machines, because machines are not real, cannot understand them and do not mean what they say. Again, the youth suggest that chatbots lack emotional intelligence, which they find necessary for mental health help. *‘For me, it only helps if it’s really someone who really understands you. Not if it’s said by a robot’*. One youth even reminded the others that we should not personify chatbots because they are not real people. *‘We keep saying “he”, but it’s an “it”’*.

4.3 Mental Well-Being Contributors

The youth were familiar with the concept of mental health, defining it as the presence of positive feelings and the lack of negative ones. Throughout our conversations, we delved into how three different sources, the participants’ lifestyle, apps and chatbots, could positively impact their mental health. We called these contributors (shown in Figure 3). We identified seven key contributors which were attributed to each of the three sources. For example, lifestyle changes, apps and chatbots could all contribute to mental well-being through providing social contact or distractions. Meanwhile, apps and chatbots could help with information and money. The remaining contributors were source-specific: disconnecting can come from lifestyle changes, help with achieving personal goals from an app, and direct help with a problem from a chatbot. In general, the contributors described were linked to

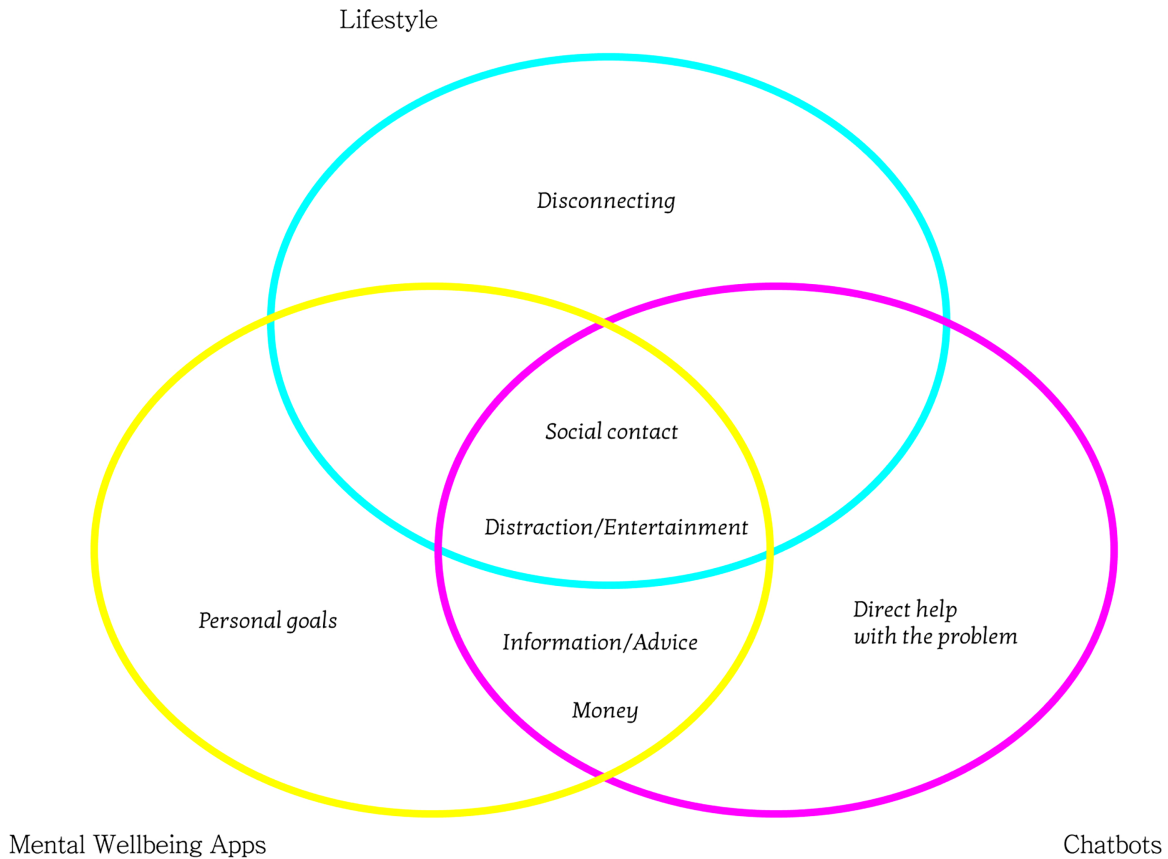


Fig. 3. Mental well-being contributors—A Venn diagram showing the visual representation of different contributors to mental well-being and how these overlap based on their source. The three sources are lifestyle (cyan), well-being apps (yellow) and chatbots (magenta).

youths' definitions of mental health (see Table 3): adding something positive and removing something negative. However, they can also be linked to some common coping strategies for mental health, such as those seen in positive psychology practices, which push for human agency and flourishing.

The second most prevalent contributor was social contact, suggesting the need to fulfil the psychological and emotional need for connection and community, which creates positive feelings. Most participants saw social contact generally, but especially with friends or people they trust, as helpful for their mental health. Although some saw more value in talking to someone they did not know. The youths suggested that an app or chatbot could link them to other services or encourage them to reach out to friends, professionals and other communities: *'the (AI) therapist says- [...] "here you will get to know each other" [...] Paul is happier because he knows he can make friends here [...] he meets people with similar interests'*.

Other contributors were more practical. For example, receiving information, obtaining financial support, achieving personal goals or receiving direct help with a problem (such as tailored advice on what to do). We see a link to positive psychology practices, which look at empowering people and enhancing their capabilities. For example, the youth highlighted the importance of information and mentioned how an app could provide this. *'It gives relationship advice and puberty advice for when you don't know what to do during puberty. It gives education*

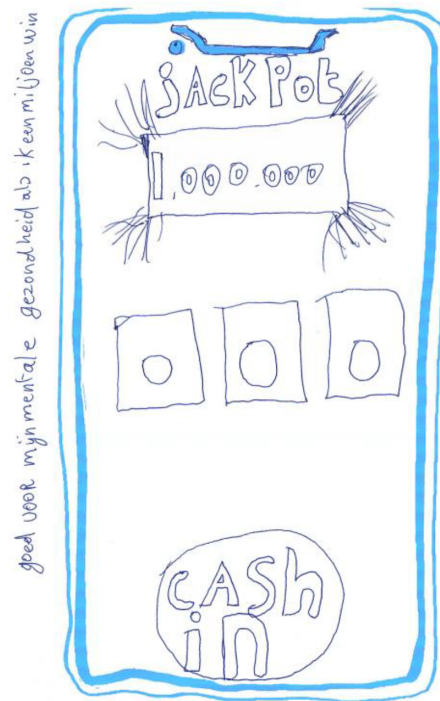


Fig. 4. Jackpot.

of different kinds of things. It helps with school, it gives boys and girls advice, it gives yes-no answers. If you ask: can my dog have grapes?' This information could also appear in the form of tailored recommendations, guiding self-development by helping them explore new hobbies or activities. 'An app that can show you things to do to be engaged in something or hobbies that you can engage in, after taking a multiple-choice test'.

Moreover, positive psychology practices promote self-awareness and behavioural change, which can be linked to app functions which help the user achieve their personal goals. For example, the youth spoke about habit tracking to become healthier. They also spoke about receiving positive reinforcement to reward consistency in behaviour change and practising gratitude by recording and remembering positive experiences. One youth suggested having 'a kind of text note where you can write down positive things about yourself and look at them [...] positive things about that day and how you felt that day [...] good memories that you can save'.

Finally, they spoke about a chatbot which gives direct help with a problem. For example, by providing solutions, reassurance or useful explanations about why something is happening. In the case of being very insecure about one's appearance, '[the chatbot] says that you should not be so insecure, [...] that you look good, [...] that you look great'. Some youth also spoke about financial support or money as a contributor. One participant drew a jackpot (Figure 4), saying, 'that would be good for my mental health'.

4.4 Requirements: Chatbot Behaviour

Despite the youth having doubts about using chatbots for mental well-being, they had clear preferences for how chatbots should behave. With regards to interactional style, participants favoured more active roles, describing passive roles that simply observe as useless. 'It's not an answer to my question. It sums it up. I don't know what I'm really getting out of it'. Instead, the youth highlighted that it is better to receive specific advice. For example, in a scenario in which a person struggles with their friendships, advice can include how to set boundaries or build

other relationships. Active roles involve interactions, delving deeper into a topic by asking questions. However, the youth noted that these questions need to be relevant and insightful. If the chatbot shows no awareness of the context, it can come off as insensitive and create more doubts. One participant commented, *‘that kid gets half depressed from all the stress. Then AI starts asking him: what are you going to do later?’* On the other hand, putting pressure on the user as opposed to taking on the role of expert was also seen as negative. *‘Because [the chatbot] knows exactly what suits you. What would I say? I really don’t know. I’m not a psychologist, am I?’*

Meanwhile, the youth stressed that the intent of the chatbot should be to support them emotionally. The outputs ranked the highest by participants were those which affirmed their feelings, encouraged reflection and empowered them. For example, they liked answers that increased their understanding of complex feelings and why they arise: *‘An answer about why he sleeps badly and has difficulty concentrating’*. Additionally, their own examples of good outputs also included these supportive features, with strong statements which help a person feel capable of making a change. *‘You don’t have to hang out with these fake girlfriends. You don’t even have to be friends. You will have a new life if you try to find real friends who do want you, where you can be yourself’*. Many of these examples aligned with the supportive communication styles commonly seen in therapy, containing elements of empathy, exploration and motivation. These behaviours require emotional intelligence, which was recognised as an important aspect of the chatbot’s tone or personality. Moreover, the youth complemented their drawings with descriptions which included positive attributes such as *‘kind’*, *‘comforting’*, *‘interesting’* and *‘understanding’*, suggesting human-like attributes, which create a safe environment. One participant commented, *‘it’s about understanding and having human touch or feeling. You must think that you are messaging with someone’*.

These ideas were reiterated when discussing the negative outputs a chatbot should avoid. For example, as opposed to providing help, the chatbot could make problems worse by compounding negative beliefs and dismissing a person’s feelings. To illustrate this, the youth described a scenario in which someone’s insecurities are confirmed by a chatbot. *‘He is at school. His classmates say: you are really very ugly. [...] The boy is completely upset. He says to his phone: AI, they keep calling me ugly and worthless. His phone says: you are ugly and worthless. [...] he says: you’re no use to me. He breaks his phone. [...] he is sad and says: shit phone’*. On the other hand, a bad chatbot output could offer impossible or inappropriate suggestions, or act in immoral ways by manipulating the user or saying rude things. For example, insulting the youth (Figure 5).

Importantly, there was no one-size-fits-all as different approaches seem better suited to different people. This was exemplified by the disagreement amongst some youth about the type of roles the chatbot should have. The youths conflicting preferences are linked to their desire for personalised outputs, such as having a chatbot which knows their name, age and general interests. Beyond that, the participants mentioned chatbots could tailor their responses to youths’ personality and mood, as they described it, *‘matching your energy’*. This could be done throughout the interaction, learning from the user, or directly through training. This would allow the chatbot to *‘know better what you like, find interesting and how you think’*, improving the help and suggestions provided. Not only did the youth prefer a chatbot with a similar personality, but also similar opinions, agreeing with the youth and confirming their world views. *‘Moderator: Does a LLM have to prove you right? Participant: Yes. Moderator: Even if you are not right? Participant: Yes’*.

4.5 Language Requirement

The youth enjoyed learning about LLMs and by the end of the sessions had a basic understanding of them. There was consistency in the youths’ opinions about the type of language that should be used by the models. Participants described natural language and avoiding difficult words, slang or swearwords. Moreover, they felt it was important that the chatbot be original in its answers and insisted that answers be short and concise. *‘No. If you ask the same question, I don’t want the same answer. I want the same answer in different sentences’*. However, there were mixed opinions about how robotic the chatbot should sound. On the one hand, they thought the tone should remain consistent: *‘I just think the LLM thing should stay a little bit the same. Otherwise, it’s going to be too*



Fig. 5. 1—Bad grades, 2—AI scolded me, 3—I had to cry, 4—It told me off again, 5—It said I am stupid, 6—He now has a panic attack.

much like talking to a friend. It's a computer'. On the other hand, some felt negatively about chatbot responses, which were overly robotic: *'The other one seemed like I was doing a Google search'*. Some of the youths described a solution to this difference in preferences—personalisation. Moreover, their desire for personalisation extended to decisions they had clear preferences about. For example, despite preferring short texts, they described preferring to have the choice of text length.

4.6 Personalisation and Privacy

From personalisation to privacy, we stressed the tradeoffs between the two and discussed what youth would feel comfortable sharing with the chatbot. Most seemed comfortable sharing basic information such as their name, interests and gender (see Table 8). However, participants preferred not to share sensitive information, such as their address or bank information (see Table 9). One commented, *'you're not going to say your private things to a computer'*. While we linked the theme of privacy to personalisation, the youth brought the idea up throughout the workshops' duration. They had a clear understanding of how companies take advantage of their users by providing inaccessible privacy policies that go unread. As one remarked, *'when you play a game, you have to say yes or no at the beginning. If I press no, I am immediately sent out of the game and then can't continue. Then I have to click yes'*. Therefore, consent is only an illusion, as one is forced to consent to be online. They also mentioned apps which require audio and camera permissions, as many chatbots do, describing these requests as an invasive practice, which is scary as *'[it] can hear and see us'*.

The youth stressed their desire for both personalisation and privacy throughout, alluding to their need for control. Moreover, asked to rate how important personalisation is to them, 72% said important and 16% said very important. It should be noted that the Mentimeter questions were only answered by 32 youths, as some worked

Table 8. Mentimeter Results (Part 1)

What they would share	Who agreed?
Age	13
Name	8
Hobbies	8
Interests	4
School information (level and grades)	4
Gender	2
Favourite things (animals, colours, food...)	3
Needs	1
Personality	1
Appearance	1
Heartbreak	1
Depression	1
Pets	1
Family members	1

Mentimeter results for what the youth would feel comfortable sharing. The numbers indicate the number of people who answered the same thing.

Table 9. Mentimeter Results (Part 2)

What they wouldn't share	Who agreed?
Address	17
Private things	7
Age	3
Phone number	3
Personal details	2
Name	2
Relationships (with family and friends)	2
School details	2
Living situation	1
Surname	1
Location	1
Passwords	1
Health information	1
Crush	1
Weaknesses	1
Feelings	1
IP address	1
e-mail	1
Payment details	1

Mentimeter results for what the youth would not feel comfortable sharing. The numbers indicate the number of people who answered the same thing.

together, 1 did not have access to the internet, and some connected to the page but never answered. The youth also expressed their desire for a tailored experience, with profiles and customisation settings, the ability to choose a colour scheme, the design, language and content.

5 Discussion

5.1 Summary of the Research and Author's Interpretations

Our research is novel as we explored the preferences of marginalised youths for an AI-based digital mental health app, specifically during the early stages of development. We used participatory methods to discover how these apps could support youth and how an LLM should behave if incorporated into these apps. This research has resulted in several important findings. Firstly, participants expressed reluctance to use chatbots when discussing mental health concerns. They saw more value in meaningful human connection, arguing that chatbots are not real and lack emotional intelligence. Secondly, if an LLM is used to produce content for an app, they want outputs which ask follow-up questions, affirm their worldview, and offer direct help with the problem: giving solutions, reassurance, or useful explanations. Moreover, they want the energy, personality, and tone of the text produced by the LLM to adapt to the users' needs. Thirdly, young people view mental health apps as helpful for maintaining social contact, offering distractions, and providing practical support, such as information about puberty, financial help, or setting personal goals. During the co-creation exercises, they showed a preference for multifunctional apps which include entertainment, links to other services and features which encourage reaching out to others. Finally, they emphasised a preference for personalised experiences which can be controlled via extensive customisation settings and clear privacy policies.

An important contribution of this study is demonstrating that young people do not want chatbots as part of their mental health support. Research on youths' perspectives on AI remains limited. While a recent survey in the United States found that young people are generally dismissive of generative AI in medical settings—emphasising the essential role of human involvement in healthcare [58]—this research did not specifically address mental health care. However, this presents a clear tension, as studies indicate that emotional support and companionship were the most common uses of generative AI among teenagers and young adults in 2025 [14:59]. We attribute this to two main reasons: the lack of effective alternatives and the emotional intelligence of LLM based chatbots. Firstly, in the Netherlands, the average waiting time for psychological help is 14 weeks, a trend that is observed worldwide. Persistent understaffing and systemic strain in mental healthcare, combined with rising mental health needs, create conditions in which alternative solutions gain popularity. On the other hand, chatbots are designed for engagement and suck people in. While initial interactions with chatbots may not be intended for mental health support, their agreeable and supportive responses can gradually steer users in that direction. Chatbots are trained to deceive their users into believing they are talking to a real person with emotionally intelligent responses and a relational style which has been found to increase trust, anthropomorphism and emotional closeness [60]. Overreliance on chatbot outputs can be problematic as our results show youth do not fact check outputs, making them easily tricked and manipulated.

Interestingly, our participants had mixed opinions about how human (versus robotic) chatbots should sound and behave. They preferred natural language and used numerous human descriptors, such as kind or understanding, to describe the desired chatbot behaviour. However, they repeatedly rejected the notion of a chatbot being too human-like. On the one hand, increasing humanness might make chatbots more pleasant to engage with; on the other hand, it is important to avoid misleading users into thinking they are interacting with a real person. The contrast between our findings and the extant literature showcases the need for other stakeholders (designers, youth workers, parents, psychologists and AI developers) to contribute to the co-creation process. For example, research shows an empathy gap in LLM-based chatbots, which can create safety concerns. Chatbots mimic empathy, which risks youths' over-reliance on them, yet they often respond inconsistently or inadequately [20]. Ensuring youth are aware that the conversation taking place is with a computer programme is advisable to reduce the risk of harm [38]. Therefore, we suggest increasing the transparency of these apps to enable true informed consent. Additionally, we suggest app developers always ask the question, is a LLM-based chatbot the best option for the app? Other, more established tools might pose fewer safety concerns and be just as or more effective.

Finally, these discrepancies prove that there is no one-size-fits-all solution, and participatory approaches need to accompany technology development to solve the youth mental health crisis. Moreover, given our participants' desire for mental health help and need for education, we propose alternative apps such as a digital assistant of an education and awareness provider. In previous interviews, mental health counsellors have made similar suggestions [61]. Alternatively, attending to the need of self-development, achieving personal goals, and receiving personalised content, the LLM could tailor notifications to an app user or provide activities, and diary prompts to help youths understand themselves better.

Surprisingly, many young people in our research seemingly felt comfortable talking about mental health issues. We expected to see more stigma surrounding the topic, as negative attitudes towards mental health conditions are a major factor contributing to the lack of help-seeking behaviours in the Netherlands [62]. Despite participants' insights, they showed gaps in their knowledge as they mentioned a need for further education. The youth understood the importance of seeking help, engaging in positive behaviours and disconnecting from their phones. However, they struggle to do so. We link their over-reliance on social media and need for extensive personalisation to a need for independence and control. The youth from the 'Talenthub' from lower-socio-economic backgrounds and at risk of dropping out of school, referred to the need for money and financial stability to improve their mental health. Research confirms the link between financial instability and worse mental health outcomes [63]. It seems that social services have failed to protect some youth from financial instability and, consequently, the mental health challenges that come with it. It is therefore unsurprising that these youth over-rely on social media, using it to feel better. Other researchers have shown that minority groups who might suffer from discrimination, have less access to public services and have been failed by institutions tend to seek comfort and refuge in social media, such as LGBTQ+ or black youth [50]. Social media not only contributes to youths' mental well-being but also empowers them to build their own narratives and express their identity freely via its self-making function [64]. Moreover, the apps are increasingly used to generate income [65], increasing people's autonomy and self-reliance. Additionally, the youth criticised existing privacy policies and data collection methods. Having extensive customisation settings can be seen as a way to regain their control, choosing what to share to get their desired experience.

We must note a series of important limitations. For example, participants spanned a wide range of ages. Here, we chose to combine different age groups in the analysis in order to align with ethical guidelines and safeguard the youth when working on such a sensitive topic. The main researchers executing the focus groups (NO, KG, RZ) were not fluent in Dutch, limiting their ability to oversee the sessions. To solve this, we worked with multiple Dutch research assistants who collaborated in drafting the session plans and took the lead in running workshops. In addition, the study PIs were native Dutch speakers. Additionally, the core research team only included women. To decrease male participants' potential reluctance to share their opinions, we collaborated closely with a male design researcher, who could only attend one workshop in person. Another limitation was the lack of university training or materials on how to work with youth. At times, the facilitators felt uncomfortable as some participants, specifically boys, joked about sensitive topics. We solved this by meeting a youth worker who shared advice on how to handle difficult situations. We also noticed that at certain moments, some participants disengaged. We attribute this to two issues. Firstly, as we partnered with youth workers, the workshops were held during their youth work time. Although we clarified they did not have to participate, some may have attended out of a sense of obligation. Secondly, the co-creation methods used were not always as effective or engaging as expected, despite prior testing. Further work needs to be done to develop new co-creation methods with and for youth. Finally, we included too many exercises in the workshops, which led to participant fatigue, especially in workshop 2. For future research, we will be more selective with the amount of work given to the youth, prioritising quality over quantity. A final caveat to our study is that it is specific to the Dutch context; these results are not internationally valid. We hope that this provides a guide for future researchers to conduct similar context-specific work in countries around the world, as different populations may have a different relationship with technology.

Notwithstanding these limitations, the workshops were successful at creating a shared understanding and future vision of AI technologies for youth mental well-being. Feedback from participants indicated that the

sessions enhanced their understanding of complex concepts, including LLMs and the tradeoff between privacy and personalisation. This further proves the importance of including them in these conversations as they grow personally and professionally, developing both transferable and disciplinary skills [32]. We also learned valuable lessons about working with marginalised youth, which can benefit other researchers who wish to engage with this often-overlooked target group. For example, workshops with too many exercises are fatiguing and leave less time for breaks and spontaneous discussions. Moreover, fewer exercises lead to more time, increasing accessibility by catering to those who need it to read, think and process information. We found that working with smaller groups is easier and more effective. Therefore, whenever the number of facilitators allowed us to, we split the participants into subgroups, decreasing the number of distractions and increasing their attention. As we used an intersectional feminist approach, we invested time into getting to know the participants, allowing us to tailor the sessions to the group in question. For example, the youth from ‘The Mall’ enjoy dancing so we chose the game Just Dance as an active energiser. Finally, we learnt how to handle difficult situations and misbehaving participants. By having clear ground rules set at the beginning, referring to these throughout and questioning youths’ behaviour in an open and respectful manner to re-engage them.

5.2 Recommendations for App Developers

Our findings have important implications for app developers. Technological solutions have benefits for youth who are used to being on their phones continuously, but only with the right design choices can these impacts be realised. Firstly, a mental well-being app should empower youth to take control of their own lives while avoiding addictive design features and encouraging adequate help-seeking. For example, there should be mechanisms included which identify if a person is in danger and/or needs to be referred to a mental healthcare professional. Mental health apps should be connected to an emergency helpline. Further, LLMs should be designed to treat youth with respect, including safeguards to prevent the LLM from treating youth inappropriately or worsening their problems. At times, this will include reducing sycophancy. Even though our discussions showed the youth want the LLM to agree with them constantly, including when they are wrong, blindly confirming a person’s beliefs can cause them harm. This is why psychologists work actively with people to try to reframe their thoughts when these are dangerous to them or the people around them. This strategy is in cognitive behavioural therapy and other related approaches [66]. On the other hand, it is important to avoid addictive design features, such as infinite scroll, autoplay functions, and personalised recommendation feeds. Alternatively, app developers should aim to foment activities which get youth off their phones. This goes against the existing business models and incentives (e.g., advertisement-based) as well as the training goals of LLMs that all optimise on engagement and prolonged interaction. However, there are already some early examples of feminist chatbots that optimise on short interactions with informative and actionable outcomes rather than engagement, like Lokai’s ‘Walk with Yeshi’⁸, the ‘Feminist WingBot’⁹ or the now unavailable ‘Ladymouth’ [67] and ‘f’xa’¹⁰.

Additionally, youth value inclusive, accessible design features. Therefore, app developers must ensure that they target and reach a broad range of users. This requires paying attention to both the visual features, UX and UI of an app. An app should be welcoming to different people. For example, images and photos must represent a diverse set of users and where categories are being used, binaries such as male and female should be avoided, instead opting for a broad range of inclusive options. Moreover, apps should be accessible to people with disabilities by integrating assistive tools by default into apps and accounting for neurodiversity by using natural, easy language and concise texts. On the other hand, technical considerations include making the content adaptable for different types of screens or interfaces and providing clear, understandable pathways for app use. As we found that youth do not review privacy policies, app developers should incorporate notions in their design (e.g., using icons) and

⁸Link to website: <https://www.akqa.com/work/locai/walk-with-yeshi/>.

⁹Link to website: <https://www.facebook.com/feministwingbot/>.

¹⁰Link to website: <https://www.comuzi.xyz/fxa>.

justify the collection of personal data. Finally, app developers must also focus on AI literacy, as youth seem to put high trust in the output of AI chatbots (e.g., they are smarter than Google), but may not always be aware of limitations such as hallucinations and biases. It is important to note that design cannot be universal, and tradeoffs must be made, but some simple features can increase the reach and usability of an app for a range of users.

6 Conclusion (Recommendations)

According to the perspective of young people in this study, the primary AI-based mental health apps should not be LLM-based chatbots for mental health therapy. Rather, the emphasis on a personalised experience, desire to be in control, need for knowledge, and unique capabilities of LLMs suggest LLMs could be used to tailor the content of the app to the youth in question, provide specific information or act as a digital assistant; while the app can include functions which increase their personal growth and facilitate help-seeking and relationship building. The youth demonstrated a strong awareness of accessibility considerations, emphasising the importance of using plain language, concise text, and inclusive design features to accommodate diverse user needs. Moreover, they want to be uplifted and treated with respect, including safeguards to prevent the LLM from treating youth inappropriately or worsening their problems. A mental well-being app should empower youth to take control of their own lives while avoiding addictive design features and encouraging adequate help-seeking. Our findings are important to create LLM-based DMHIs that fit the needs and preferences of marginalised youth. Making assumptions or incorrect generalisations creates a risk that interventions are not accepted by marginalised youth, which increases existing health inequalities. Further, our approach and lessons learned of working with marginalised youth provide important starting points for future work that engages this often overlooked target group. We recommend app developers listen to youths' opinions and co-develop apps which truly cater to their needs. Future work must explore other key stakeholders' expert knowledge and include youth in the next steps of the co-creation process.

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Data Availability

Anonymised data underlying this manuscript will be made available by the authors upon reasonable request.

Declaration of Conflicting Interest

The authors report no declaration of conflicting interest.

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Appendix A

A.1 Proposed Ideas for the Ideal App

Table A1. The Ideal App Proposals

Functional	Non-Functional
Habit tracking	Multifunctional app
Give recommendations (books, video, music...)	Free
Diary/notes section	Link to other apps
Suggest activities (where to go, what to see...)	Personalizable and customizable
Provide entertainment (videos, music, texts...)	With accessibility features (magnifying glass...)
Search for information	Concise short texts
Promote a healthy lifestyle (tips)	Easy language
Functional mental health help (breathing exercises...)	Easy to navigate
Contact/communicate/share	Aesthetic user interface
Save/ store (memories, quotes, photos)	Simple but effective
Provide financial support	Funny, king, helpful, understanding
Creative section (area to draw)	Distracting
Nature section (information, reminders, tips)	Inspiring
Faith section (religious practices...)	Informing and educating
Game	
Giving inspiring quotes	
Helping to relaxing	
Have a personal profile or avatar	
Providing advice	

Functional requirements define what the system should do, while non-functional requirements define how the system should perform.

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