

ONLINE ALEXITHYMIA QUESTIONNAIRE FOR CHILDREN WITH T1 DIABETES

Apostolos Mpostanis, Athanasios Katsios, Stefanos Argyriou, Stavros Vakalis, Nikos Marousis, Panagiotis Katrakazas, Member, IEEE and Dimitrios-Dionysios Koutsouris, Senior Member, IEEE



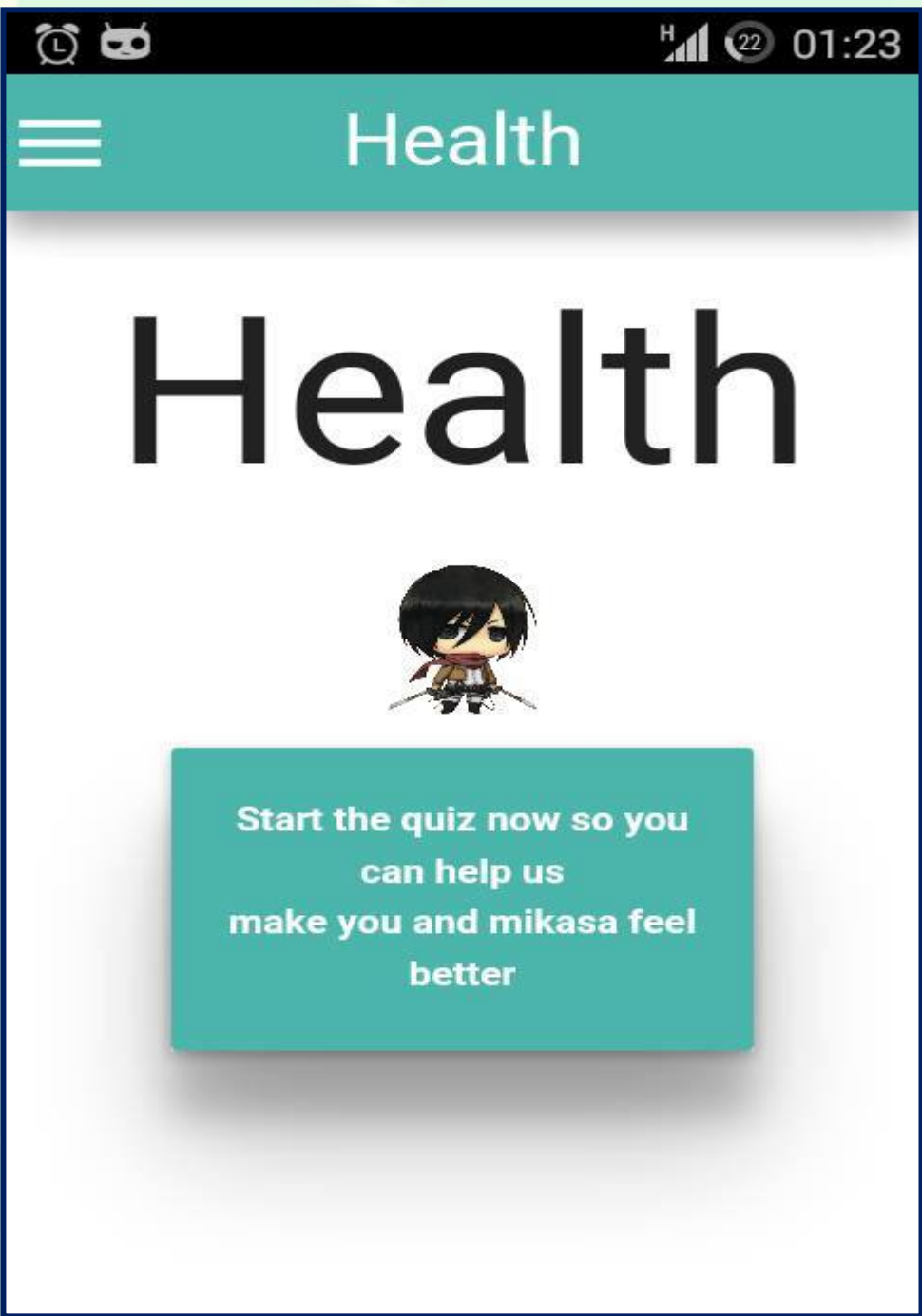
ABSTRACT

Alexithymia refers to a limited ability to identify and communicate ones feelings, which has been frequently associated with physical health complaints and negative moods. A plethora of studies have already confirmed the association of alexithymia and type 1 diabetes (T1D) both for adults and pre-teenage children. The concept of this project is the creation of an online application to measure the alexithymia levels of children, 8 -12 years old, and give a qualitative measure of each subject's susceptibility to reduced glycaemic control. The application is designed to inspire familiarity to the child user, while providing adequate information to the supervising doctor.



Discussion / Future Work

Along the premises of our work, a mobile application is currently under development, along with more tools that will enable a broader distribution of the application and fascillitate its diagnostic capabilities. Under this spectrum, a chatbot, supporting facial recognition, will allow younger children to use the application and make the test-taking process more interactive. Finally, one of the central aims has always been the ability to export the questionnaire's results according to the openEHR XML_schema, while also maintaining a calendar-type log history for each user for monthly assessments of their emotional health.



CONCLUSION

It can be concluded that the complex nature of alexithymia explained with the results of the TAS-20QC can help predict the appearence of Type-1 Diabetes in children. Through the use of the application described in the present paper, it is possible to counteract the negative reverberations of the particular disorder early on using appropriate preventive measures. Because of the studies involing the connection between alexithymia and other disorders in adults, it is our strong belief that in the next years more studies will be made about alexithymia in children and the particular project will play an important role in their shaping.



REFERENCES

- [1] M. Housiaux et al., "Difficulties describing feelings to others still predicts glycaemic control up to 24 months later in children with type 1 diabetes.," *Diabetes Metab.*, Jan. 2016.
- [2] C. Rieffe et al, "An alexithymia questionnaire for children: Factorial and concurrent validation results," *Pers. Individ. Dif.*, v40, n1, pp. 123–133, 2006.
- [3] M. Gatta et al., "Alexithymic characteristics in pediatric patients with primary headache: a comparison between migraine and tension-type headache.," *J. Headache Pain*, v16, p98, 2015.
- [4] L. Mnif et al., "Alexithymia impact on type 1 and type 2 diabetes: a case-control study.," *Ann. Endocrinol. (Paris)*., v75, n4, pp. 213–9, Sep. 2014.
- [5] A. V Lemche et al., "Alexithymia as a risk factor for type 2 diabetes mellitus in the metabolic syndrome: a cross-sectional study.," *Psychiatry Res.*, vol. 215, no. 2, pp. 438–43, Feb. 2014.

Can an application predict Type-1 Diabetes in children before it even manifests?

RESULTS

Starting Screen

Health



Start the quiz now so you can help us make you and mikasa feel better

Sign up Form

First Name

Age

Date

SUBMIT



Questions

Whats wrong mikasa?

I find it difficult to say how I feel inside

NOT TRUE BIT TRUE TRUE

Results

Name	lastname	age	dif	ddf	eot	
name1	name2	9	1.6	1	1	EXPORT XML
name3	name4	10	0	0	0	EXPORT XML

INTRODUCTION

Toronto alexithymia scale (TAS-20) is the most widely used self-report questionnaire , consisting of 20 items, to measure alexithymia in adults [1]. While alexithymia has a lot of features to be taken into account, the TAS-20 covers only three core features: i) Difficulty Identifying Feeling (DIF), ii) Difficulty Describing Feelings (DDF) , iii) Externally-Oriented Thinking (EOT). Despite the fact that there have been many studies involving the connection between alexithymia and various disorders in adults, alexithymia in children and teenagers has barely been investigated. The TAS-20 questionnaire for children (TAS-20QC), with 20 items and a 3-point response scale, is a children-friendly version of the TAS-20 [2]. Since the publication of TAS-20QC, only a handful of studies have made use of the particular scale in an effort to associate alexithymia with common health problems, like primary headache [3]. The trigger of this project was that, while articles of alexithymia and its association with type 1 diabetes, as well as type 2 [4], [5] on children have multiplied during the recent years and made a solid point that higher scores for alexithymia factors in diabetic children (especially DDF) have a close connection with poorer glycaemic control, there has been no visually appealing implementation of the TAS-20QC aimed at children.

METHODOLOGY

Implementation of TAS-20QC was realized as a website application. Users, children ranging from 8 to 12 years old, sign up and fill the questionnaire via an interface which utilises familiar concepts, e.g. protagonists from the animated series "Shingeki no Kyojin" and bubble-like dialogue. After the questionnaire is completed, the three Alexithymia related factors (DIF, DDF and EOT) are calculated and saved in the database: These factors are not directly viewable by the users, in order not to affect future inputs, but only by their supervising doctor who can log in as a special user to view them. Children using the application will be motivated to interact again with their favourite animated hero and take their time reading the questions and answer how they respond to them instead of bypassing the questionnaire in order to finish it. From a technical viewpoint, the website design was done using mockups. The backend was implemented using the Meteor framework with the following additional packages: BlazeLayout for templating, FlowRouter for routing and Materialize as a CSS Library. As far as the frontend development is concerned, HTML, CSS, Materialize, Javascript and J-Query were used in order to create a stylish and colorful user interface aiming to capture the attention of the children. User data is stored using MongoDB.