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| **WP7 - Finland**  **Individual pilot action report** |
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**1. Health and wellbeing for all – development and implementation of a culturally sensitive lifestyle intervention for Somalis in Finland through the adoption of JA CHRODIS recommendations and set of criteria**

**2.Abstract**

Somalis, particularly women, have high levels of type 2 diabetes (T2D) and its risk factors. People with immigrant background are a hard-to-reach population segment and may face language and conceptual barriers against participation in preventive interventions, especially when offered in health care context.

The objectives of our pilot were to improve access to T2D preventive services by underserved population and among them, to increase awareness on T2D risk factors and adoption of healthy lifestyles.

The JA CHRODIS recommendations and criteria at focus were “Practice design”, “Target population empowerment”, “Education and training”, and “Ethical considerations”.

The intervention was organized in the mosque by a Somali researcher and volunteer health care students and comprised of T2D risk detection with FINDRISC risk score followed by group and digital lifestyle counselling. Altogether 24 participants joined the pilot.

The impact of the intervention was assessed quantitatively with clinical and lifestyle measures taken before and after the intervention. Qualitative measures included a survey on participants’ experiences and opinions of the pilot intervention.

Moderate positive changes in some health measurements, diet and physical activity were seen.

The pilot proved to be a feasible model to provide prevention interventions to an underserved population group. The co-created T2D prevention intervention model could be transferred to other Somali communities and other immigrant groups in Finland and other countries, but would require close collaboration with the target population as well as training of the local implementers. It is important to establish collaboration between health care services and preventive intervention providers as well as other stakeholders.

**Short summary**

*• Background:* Somalis, particularly women, have higher levels of type 2 diabetes (T2D) and its risk factors compared to both the other immigrant groups and native Finns. Lifestyle interventions targeted at people at risk have been shown to effectively prevent T2D. Preventive interventions are usually tailored to suit the needs of the majority. People with immigrant background are a hard-to-reach population segment and may face language barrier effectively blocking their participation in preventive interventions. According to our situation analysis, immigrant people tend to see health care services to be meant only for people who are sick and not for prevention of diseases.

*• Specific aims:* The purpose of this pilot action was to create and test a lifestyle intervention model for an immigrant population group and to improve the risk identification and participation of the target population by making the intervention culturally acceptable and taking the intervention near to the people. The general objectives were to improve access to T2D preventive services by underserved population and among them, to increase awareness on T2D risk factors and adoption of healthy lifestyles.

*• Interventions:* We used the JA CHRODIS recommendations and criteria[[1]](#footnote-1) as a framework to guide the development of the lifestyle intervention model based on the available StopDia T2D intervention[[2]](#footnote-2). The QCR-criteria selected as the focus were “Practice design”, “Target population empowerment”, “Education and training”, and “Ethical considerations”. The target population included adult Somali individuals living in the capital region. The intervention comprised of two stages: risk detection and lifestyle counselling. The risk was determined by filling out the diabetes risk score FINDRISC[[3]](#footnote-3). If the individual was at risk (12 points or more in the test, or previous gestational diabetes), they were eligible. The lifestyle intervention model comprised of group lifestyle counselling (six meetings in 12 weeks) and the BitHabit healthy lifestyle support mobile application. The intervention was conducted in cooperation with the mosque in Pasila, Helsinki, and the risk screening and group meetings were also held in their facilities. The group intervention was based on self-determination and self-regulation theories.

*• Study of the intervention:* The impact of the intervention was assessed quantitatively with clinical and lifestyle measures taken before and after the intervention, measuring of participation in risk screening and group meetings and the use of the mobile application. Qualitative measures included a survey on participants’ experiences and opinions of the pilot intervention.

• *Results:* About 90 persons filled in the FINDRISC, 33 (37%) were at increased risk and 24 (18 women and 6 men, 73% of those at increased risk) agreed to participate in the intervention. Moderate positive changes in some of the health measurements were seen even though they generally did not reach statistical significance. The score measuring overall diet quality was higher for all participants after the intervention (49.5±12.1 vs. 45.4±14.3). At the baseline 50% and at the end 80% of the participants reported eating vegetables at least once a day (p for difference<0.05). Participants also reported higher frequency of breakfast consumption after the intervention compared to baseline. Perceived competence in increasing physical activity and an increase in both incidental and planned exercise was seen, as well as an increase in daily step count from 3771±2866 to 4568±2080. All participants registered as BitHabit users, 19 (76%) of users chose at least one healthy habit to pursue. Average number of actions selected by users was 46.7±71.

*• Suggestions for future implementations, sustainability and replicability:* The pilot proved to be a feasible model to provide prevention interventions to an underserved population group. The co-created T2D prevention intervention model could be transferred to other Somali communities in Finland and other countries, but would require close collaboration with the target population as well as training of the local implementers. Same intervention could be feasible, after adjustment and translation, for other immigrant groups and would benefit people with other risk factors also, not just those who are at high type 2 diabetes risk. It is important to establish collaboration between health care services and preventive intervention providers as well as other stakeholders

**Introduction**

**3. Problem Description**

Type 2 diabetes (T2D) is a common disorder in Finland and in the world. It has been estimated that there are close to half a million people with type 2 diabetes in Finland. In addition to direct health care costs, diabetes causes substantial societal costs. Like many chronic diseases, T2D is distributed unevenly among different demographic groups. One factor affecting the risk of T2D is ethnicity. The largest immigrant groups in Finland are Russians, Estonians and Somalis. According to research, Somalis have the highest levels of T2D compared to both the other immigrant groups and native Finns[[4]](#footnote-4).

Obesity, unbalanced diet, and low physical activity are main lifestyle-related risk factors for T2D.The relationships between ethnic background and lifestyle factors are still widely unknown. There are many individual, social and societal factors at play[[5]](#footnote-5). Lifestyle interventions targeted at people at risk have been shown to effectively prevent or postpone T2D. However, the effectiveness of interventions in different immigrant groups is not well known, as people with immigrant background are underrepresented in prevention interventions[[6]](#footnote-6). Interventions are usually tailored to suit the needs of the majority, and hence their methods and results cannot be directly generalized to minorities. Cultural factors may have a significant effect on whether an intervention done in other groups will be feasible for ethnic minorities. Furthermore, people with immigrant background are a hard-to-reach population segment and may face language barrier effectively prevention their participation in interventions.

**4. Available knowledge**

Between 2010 and 2012 the National Institute for Health and Welfare conducted the Migrant Health and Wellbeing Study (Maamu), in an attempt to gather information on the health, wellbeing, the use of services and living conditions of Russian-speaking, Somali and Kurdish populations in Finland 4. This was the first effort to gather comprehensive migrant data in Finland. The Maamu study revealed that Somalis reported significantly higher levels of diabetes compared to any of the other migrant groups and native Finns.

The differences between these ethnic groups can be partly explained by genetic predisposition and partly by lifestyle factors. The Maamu Study also detected that there are differences between ethnic groups in diets, especially fruit and vegetable intake, and exercise habits. Epidemiologic studies have concluded that being overweight, having a poor diet and sedentary lifestyle are risk factors for diabetes. The Maamu study concluded that the Somali population living in Finland had many risk factors predisposing them to type T2D. Lifestyle and risk factors of African migrant groups, including Somalis, are not well-studied. There have been very few reports on interventions done in the Somali population, and most of the times they have been short-term, and they have had a focus on other health problems than lifestyle factors relating to chronic diseases[[7]](#footnote-7). In fact, people coming from other cultural backgrounds may not even perceive chronic disease prevention to be a part of health care and would seek help only when sick.

**5. Rationale**

The model of social determinants of health5 maps the relationship between the individual, environment and health. The core of the model consists of individuals with different sociodemographic characteristics. According to the model, individual’s health is partly determined by individual lifestyle factors, such as diet, physical activity and smoking. In addition, social and community networks, living and working conditions and other broader socio-economic, cultural and environmental factors can impact people's risk of getting diseases, their ability to prevent them, or their access to effective lifestyle interventions and treatments.

We developed the current intervention based on the available Stop Diabetes (StopDia) operational model in close collaboration with the Somali community. All materials used in the intervention were translated and culturally adapted, and the participants were divided to groups by gender, for cultural reasons. The intervention was expected to work for many reasons. Firstly, the methodology and the contents of the intervention were evidence-based and the conduct of the intervention was guided by theory of behaviour change. The feasibility of the screening, recruitment and intervention has been tested in general population in health care setting. Secondly, both the risk screening and participant recruitment and the group meetings were planned to take place in the mosque, which is a recognized place and acts as a community centre for the Somalis in the capital region of Helsinki. This is where majority of the Somali population in Finland live. Thirdly, both the researcher conducting the lifestyle coaching and the volunteering healthcare students are all members of the Somali community, meaning that they know the culture and language. Furthermore, the researcher has gained trust in the community as she has organized health-related seminars in the Somali community before.

**6. Specific aims**

The purpose of this pilot action was to create and test a lifestyle intervention model for an immigrant population group and to improve the risk identification and participation of the target population by making the intervention culturally acceptable and taking the intervention near to the people. The general objectives were to improve access to diabetes preventive services by underserved population and among them, to increase awareness on diabetes risk factors and adoption of healthy lifestyles through culturally adapted promotion and prevention activities.

We used the JA CHRODIS recommendations and criteria as a framework to guide the development of the lifestyle intervention model based on the StopDia intervention, specifically tailored to the Somali population, and to examine the effects and suitability of the concept on this specific population. The QCR-criteria selected as the focus were “Practice design”, “Target population empowerment”, “Education and training”, and “Ethical considerations”.

Furthermore, the aim was to investigate the special traits and needs when engaging in a lifestyle change, especially those factors that enable and disable a lifestyle change. Because this was a proof-of-concept pilot, we did not have a comparison group, and the evaluation of the results is based on measurements before and after the intervention, as well as qualitative data collection.

**Methods**

**7. Context**

The existing StopDia type 2 diabetes prevention model for health care was used as a base. However, according to our situation analysis, health care is not a good place to reach people with immigrant background, both because of language issues but also because often immigrant people think that health care services are meant only for people who are sick and not for prevention.

The pilot was conducted in cooperation with the mosque in Pasila, Helsinki. Working with the mosque was identified as an important strength in the SWOT analysis conducted in the LIWG meeting, because the mosque acts as a community centre for the Somali population living in the capital region of Helsinki. To ensure the suitability of the intervention model and tools we held workshops and group discussions with representatives from the Somali community. We mapped out the experiences and wishes of the Somali community in terms of the intervention and its execution, which is also a strength as regards to achieving a successful intervention. The situation analysis was led by a researcher with a Somali background (Idil Hussein) in collaboration with individuals from the Somali community, with the support from a more experienced group of researchers. She also conducted the adaptation and translation of the intervention itself, in collaboration with the volunteers from the Somali community. Having a researcher from the Somali community brought trust and awareness and was one of the key success factors, since this is a hard-to-reach population.

The identified weaknesses and threats included factors such as cultural acceptability, difficult recruitment, and loss of motivation leading to a drop-out. To combat these, we tailored the intervention keeping in mind cultural factors that may affect participation. The participants were recruited from individuals taking part in the mosque’s activities. Personal contacts (word-of-mouth) and a written notification on public display in the mosque aided the recruitment process, as well as the support and endorsement of the imam. Idil Hussein organized several recruitment sessions in the mosque, where she was personally present to give information on the pilot, thus increasing awareness and creating trust on the intervention. In addition, collaboration was established with the Finnish Somali League, in order to get in touch with men at risk.

The FINDRISC is a validated method to identify, with 8 questions, an individual’s likelihood to develop T2D within 10 years. For the pilot, the FINDRISC was translated and printed in Somalian language. For cultural acceptability, the interventions were organized separately for men and women.

There was a potential weakness in terms of scientific evaluation, because the results could be evident but not statistically significant (due to low sample size), and there was no control group for comparison. However, because of the nature of the study, just by their participation, valuable knowledge on this population was gained.

**8. Intervention(s)**

The target population included adult Somali individuals living in the capital region, who have an increased risk to acquire type 2 diabetes, but do not have diabetes yet. The intervention comprised of two stages: risk detection and lifestyle counselling. The risk was determined prior to recruitment by filling out the diabetes risk score FINDRISC. The word regarding this study was spread by personal contacts and by a written notification, which was placed in the mosque. The researcher and the volunteer nursing students who were also members of the community themselves were available in the mosque on certain days and assisted, if needed, the people to fill out the FINDRISC. They brought measuring devices with them, in order to help the potential participants with the required measurements (waist circumference, weight and height, calculation of BMI) when necessary. The FINDRISC was given to individuals interested in the intervention. If the individual passed beyond the threshold for increased diabetes risk (12 points or more on the test) or previous gestational diabetes, they were asked to join the study and received an informational handout regarding the pilot. Individuals interested in taking part were asked to fill out a consent form. Participation was voluntary. The participants were recruited into two pilot groups, one for males and the other, for females. Both groups were planned to include maximum of 15 adults, who had an increased risk to get type 2 diabetes. Originally, our aim was to offer a digital-only intervention for those individuals with increased risk, but no time or interest to take part in the 6 group meetings. However, during recruitment it became evident that the digital-only intervention was not appealing to this target group and everybody wanted to sign up for the group intervention also.

The lifestyle intervention model was comprised of group lifestyle counselling (six meetings in 12 weeks) and the BitHabit healthy lifestyle support mobile application. The intervention was conducted in cooperation with the mosque in Pasila, Helsinki, and the group meetings were also held in their facilities.

The group intervention was based on self-determination and self-regulation theories. Each group meeting lasted for approximately 1,5 hours, and each meeting had a specific theme but similar structure. The themes of the meetings were “Getting acquainted”, “Pattern matters”, “Eating well”, “Joy of movement”, “Active everyday”, and “Maintenance”. The meetings consisted mostly of pair and group discussions, and the instructor was a coach rather than a lecturer. Between the group meetings, the participants could, if they wanted, do homework and exercises using the participant’s workbook, such as keeping a diary of their physical activities or fruit and vegetable consumption. The aim of the homework was to enhance the adoption of behaviours that were discussed during the face-to-face meetings.

The BitHabit healthy lifestyle support mobile application was implemented as a web application. The application could be used with all smart devices, such as computers, tablets, and smart phones, and did not require installing a separate application. The participants received a personalized link by email and SMS message and could access the application directly by clicking the link. The main functionalities of the BitHabit application are 1) browsing behavioral suggestions and selecting those that the users want to perform, 2) daily self-monitoring of the selected behaviors, and 3) getting summary feedback for habit formation in each of the 13 lifestyle categories. The application also provides information on other users’ selections in an anonymous format through pop-up messages. Reminders are sent by emails and SMS messages if the user does not select any habits, add any performance, start using the application within two days after the first uptake message, or use the application for seven days. The application also has an additional self-learning section that provides reliable information on the prevention of type 2 diabetes. The participants could use the BitHabit throughout the 12-week intervention period.

The LIWG involved in the work comprised of experts from the Finnish institute for Health and Welfare THL (general coordination and management of all activities), University of Eastern Finland UEF (intellectual support, lifestyle intervention training), VTT Technical Research Centre of Finland (BitHabit application) and Helsinki Islamic Center. Other stakeholders were the Finnish Somali League (recruitment assistance), the Finnish Medical Association (potential scale-up), the Finnish Diabetes Association (source of intervention materials), the Finnish Heart Association (intellectual support, collaborator in intervention material development), and Helsinki University Hospital (potential scale-up). Furthermore, the working group was assisted by a group of volunteering health care students with a Somali background. The volunteers helped with the cultural adaptation of the materials and the health measurements before and after the intervention. These volunteers were all trained in taking health measurements for research purposes.

***9. Study of the Intervention(s)***

The impact of the intervention was assessed quantitatively with clinical and lifestyle measures taken before and after the intervention, measuring of participation in risk screening and group meeting and the use of the mobile application. Qualitative measures included a survey on participants’ experiences and opinions of the pilot intervention and the perceived usefulness of the group meetings and the mobile application, as well as collection of the volunteer health care students’ perceptions on this kind of activity.

Since the study was a proof-of-concept study, it did not rely on power calculations and we did not have a comparison group. As we consider including a non-treatment control group unethical in this setting, we rely the evaluation of the intervention effects on the pre and post measurements. The downside is that without a control group, we cannot claim that the possible changes achieved during the intervention are actually the result of the intervention. It is possible that the mere participation in the project leads to improved lifestyles (the so-called Hawthorne effect). However, we collected process data on participation in the group sessions as well as detailed log on the use of the mobile application. By comparing these data with the effect measures we can estimate whether the changes are due to the intervention. Furthermore, we collected qualitative data on participants’ perspectives on the intervention which is equally important and will guide the larger implementation of the intervention in the future. As part of the monitoring of the implementation, intermediary evaluation against JA CHRODIS recommendations and criteria as well as a study visit was conducted for intermediary assessment of implementation. Together with the outcome evaluation results these will guide the next PDSA cycle that will be conducted during the possible scale-up of the pilot.

**10.Measures**

We originally chose five key performance indicators. The first key performance indicator was dealing with organizing training by professionals to the instructors who would be carrying out the lifestyle intervention. The second key performance indicator was recruiting enough participants who have signed the consent form i.e. ready and willing to take part. Our third key performance indicator was to have three participant groups: male, female, application only. Fourth key performance indicator was to have completed group meetings by January 2019, and lastly, the fifth key performance indicator was to have valid and comparable measurements of the participants.

The key performance indicators were chosen to reflect the presumed contextual barriers and carriers, especially related to scalability of the pilot. We considered important to have the intervention delivered and the measurements taken by members of the target population and taking the intervention to a familiar place, as this is a hard-to-reach population group. Therefore, we chose to train the available personnel rather than bringing in already trained personnel from outside the community, and to conduct the risk assessment in the mosque. We were also concerned about the participation/drop-out rate and therefore decided to evaluate the intervention and measurement participation.

Not all key performance indicators stayed true. Firstly, we experienced our first big delay in terms of ethical clearance. We had to seek ethical clearance outside of the Institute, and that took us quite many weeks. Originally, we planned to start the intervention in October and finish it in January 2019. However, we received the clearance late November and were able to start in December. Regardless, the process of recruiting participants and starting the group meetings happened very smoothly in a relatively short span of time. Secondly, due to the fact that none of the participants wanted to be a part of an ‘application only’- group, we only had two groups of participants, female and male.

The clinical measurements were taken in the mosque, and they were taken by health care students who are also a part of the Somali community. They were trained on how to take good, valid measurements and on good research conduct. These measurements included height, weight, waist circumference and blood pressure measurements. In addition to measurements, the participants filled out a questionnaire intended to map out their background information, physical activity and dietary habits. The changes in these measures during the intervention were used to evaluate the effects of the intervention. In addition, the participants used a physical activity measuring device for six days. The BitHabit mobile application automatically collected user data, including how often they open the application, for how long they use it, which BitHabits they choose for themselves, which BitHabits they record to have completed .

**11. Pilot action plan**

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|  | **M1** | **M2** | **M3** | **M4** | **M5** | **M6** | **M7** | **M8** | **M9** | **M10** | **M11** | **M12** |
|  | **5/18** | **6/18** | **7/18** | **8/18** | **9/18** | **10/18** | **11/18** | **12/18** | **1/19** | **2/19** | **3/19** | **4/19** |
| **LIWG meetings/situation analysis** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultural adjustment and translation of the materials** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Training to conduct the group intervention** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Ethical clearing** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Training to conduct the measurements** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Recruitment of participants** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Baseline measurements** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Lifestyle intervention** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Final measurements** |  |  |  |  |  |  |  |  |  |  |  |  |

**12. Analysis**

The health measurement data and the data from the questionnaire answers were manually transferred to Excel. The data was further analysed on SPSS (version 25). For continuous variables (health measurements, diet score), change from baseline to the end of the intervention was calculated subtracting the baseline value from the follow-up value and further analysed with t-test. Values for these variables were presented as means and standard deviations. For categorical variables outcomes were reported as number and percentage of participants belonging to each category.

Four different types of data were collected. Firstly, we collected health measurement data in both baseline and follow-up measurements. Health measurement data included height, weight, waist circumference, and blood pressure. Secondly, we collected health questionnaire data on the participants’ nutrition and exercise habits, also during baseline and follow-up measures. Questionnaire also included background information and questions about satisfaction on life etc. Thirdly, the participants’ were given the possibility to wear an accelerometer to record their movement during six days prior to starting the group meetings and after them. Finally, data on the usage of the BitHabit-mobile application was collected.

The indicators for outcome evaluation were diet quality (calculated using a Healthy Diet Score), intake of fruit and berries, and vegetables, and the average number of steps per day. The score for diet quality was calculated using a score created in the StopDia2 study modified according to the needs of Somali-intervention and calculated for baseline and follow-up. Means of self-reported variables were compared between baseline and follow-up to detect the possible effect of the intervention.

**13. Ethical considerations**

Our pilot has a potential to be a model to organize preventive lifestyle interventions for immigrants, by using collaborative development, cultural adjustments, by taking the intervention close to people to their own familiar surroundings, and utilising experts and volunteers from the same cultural community.

The representatives of the target group have participated in the planning of the pilot and are thus well aware of the objectives and the strategy of the pilot. The mosque is not only a place of worship, it acts as a community center and therefore a good place to reach the target population. The StopDia model (upon which the current pilot is based) takes place in primary health care. However, according to our situation analysis, health care is not a good place to reach people with immigrant background, both because of language issues but also because often immigrant people think that health care services are meant only for people who are sick and not for prevention.

In our pilot we approached members of an underserved population group, in order to identify individuals at type 2 diabetes risk and offer them lifestyle intervention. Furthermore, we were collecting information for evaluation and research purposes. Therefore, we acquired an ethics evaluation for the pilot from the ethical committee of the Helsinki University Hospital. Specific attention was put on the respectful conduct of the activities, as well as providing enough information for the participants in order to make informed decision to participate. The participants got an information letter which was also read and explained to them orally. After that the ones who were interested to participate in the pilot signed the informed consent.

The intervention as such was not likely to cause side effects of any kind, as it was based on general nutrition recommendations on health-promoting diet, with emphasis on dietary factors that have been proven to contribute to T2D risk. However, we were not able to complete blood testing, so our outcome evaluation was based on lifestyle and anthropometric indicators only. Therefore, we were not able to verify the glycaemic status of the participants. To avoid false assurance of health, we advised those who based on their FINDRISC value were at high risk, to contact their own health care provider in order to rule out the possibility of undiagnosed T2D.

A concern was raised about using the mobile application as part of the intervention, as the participants had to own a smartphone or computer to be able to join the pilot. However, majority of the target group owns a smartphone nowadays, so the use of the app is not expected to be a barrier for participation. Data collection and protection conduct and rules (following the GDPR) were explained to the participants.

***14. Results (****What did you find?)*

Our pilot intervention comprised of one PDSA cycle. However, during the implementation there were important learnings that would be useful for future implementation of the model. Our initial steps of the implementation were relatively smooth and straight-forward. Instead of four meetings, we combined the meetings with our LIWG into two efficient meetings. We agreed on the steps to be taken in terms of the intervention and we then we started implementing the intervention.

The only deviation from the project plan happened at the recruitment phase of the project. Originally we wanted to have three groups of participants: men, women, and digital application only, which would then be used as a comparison to attending group meetings. The application only-group was intended to serve those at risk individuals, who did not have the time or the interest to participate in the group meetings, and provide information on the feasibility of using digital healthy lifestyle support in this specific target group. However, every participant wanted to attend the group meetings and hence there was no need for a third group.

In terms of contextual elements that interacted with the intervention, the only major element was scheduling of the group-based intervention. On the first group meeting, we had to agree on the specifics of future meetings. In the women’s group, almost everyone had a different timetable and the only rational way to agree on the starting time of the future meetings was by majority vote. We agreed on a timeslot, but this of course meant that there were always some individuals who could not attend the meeting due to time constraints. One participant who could not make it to the group meetings due to the chosen day and time came up with an alternative way: she suggested if she could join the session by phone, which was of course allowed. However, she still was not able to join all six meetings via phone due to her timetable. In the future, to avoid problems stemming from scheduling, it would be worth considering recruiting people with a similar lifestyle from for example a school or a work place. This would make scheduling the group meetings much easier, since the participants would have a similar timetable. In our female group, we had students, workers and stay-at-home mothers. It is safe to say they have a different rhythm, and this affected the participation rate.

Another contextual element that came to daylight was also time-related. It quickly became evident that the 1.5h-2h timeslot that was dedicated to each meeting was not enough. Depending on the participation rate of the session we would almost always go over time because the discussion would be flowing or because the finishing of the tasks take longer in practice than in theory. Going through the previous meeting’s homework also took time, and this needs to be taken into account.

Regarding unintended consequences, we noticed the almost constant positive attention the intervention was receiving whenever there was a group meeting scheduled. Almost after every session someone would come up and ask us what we were doing and how can they join. The fact that the intervention was carried out in the mosque might have an effect on this; due to the mosque being such a familiar place to most of the visitors, people feel that they have a low barrier to ask and participate in different things. Furthermore, when we were conducting the first and last measurements, we measured many people who were not a part of the intervention but who wanted to get measured.

Missing measurement data was due to the fact that the participant could not be reached, despite many attempts. After all efforts taken we measured totally 24 participants at a baseline and 22 of them took part in group session and were measured for the second time. To determine if the intervention was effective for those who participated in group sessions, we evaluated changes in the self-reported variables and health measurements at a baseline and follow-up. For self-reported variables, we focused on those which reflected the topics discussed in the group sessions e.g. vegetable consumption, physical activity.

Altogether about 90 persons filled in the FINDRISC, 33 (37%) were at increased risk and 24 (18 women and 6 men, 73% of those at increased risk) agreed to participate in the intervention. There were small positive changes in some of the health measurements even though they did not reach statistical significance. A positive change in waist circumference was detected for all participants between baseline and follow-up measurements (106.2±94🡪 105.5±11.3). This was seen in both women and men (104.6±9.2 🡪 103.7±11.9; 111.1±91 🡪109.9±9.3). There was also a positive change in systolic blood pressure (119±18 🡪 117±15). For all participants, there was an increase in step count from 3771±2866 to 4568±2080.

Participants reported positive changes in some of the variables related to eating and exercise habits. At the end of the intervention 80% of all the participants reported eating vegetables at least once a day. The same number for baseline was 50%. This change was statistically significant (p<0.05). There were no changes in fruit and berries consumption. Participants also reported higher frequency of breakfast consumption after the intervention compared to baseline. The score measuring overall diet quality was higher for all participants after the intervention (45.4±14.3 🡪 49.5±12.1).

Perceived competence in increasing physical activity was higher after the intervention when 90.5% of all participants reported being very competent increasing physical activity. Participants also reported increase in both incidental and planned exercise. Percentage of participants who reported doing incidental exercise three times or more per week increased from 47.5% to 85.7% during the intervention, and for planned exercise 47.6% reported doing it at least three times a week compared to only 22.7% who reported the same at a baseline. This is consistent with the increase in average step count measured with pedometer.

All the participants who took part in group session registered as BitHabit web app users. User activity varied greatly but all users were actively viewing the habit selection window, even it did not lead to any selection of actions. 19 (76%) users chose at least one habit and 17 (68%) marked it as completed. Average number of actions selected by users was 46.7±71, and altogether 696±1376 actions were completed.

The observed changes in lifestyles and risk factors can be considered moderate. However, even small changes in important behaviours (e.g. increase in consumption of vegetables) could have a large impact on population level. Furthermore, the participants expressed interest to continue the lifestyle changes also after the pilot period. They even requested for an additional follow-up meeting with repeated outcome measurements. Unfortunately our ethical clearance did not cover that and thus we could not arrange it.

In general, taking the culturally and linguistically adjusted intervention close to the participants, and having it delivered by members of the target community, proved to be a well-received concept of providing preventive intervention to this under-served population segment.

**15. Implementation process**

The selected Quality Criteria and Recommendations were Practice design, Target population empowerment, Education and training and Ethical considerations. In terms of practice design, the enablers that were identified dealt with the ability to culturally adjust a lifestyle education intervention. The fact that the instructor belonged to the target population is a valuable enabler, not only in terms of speaking the language but also in term of gaining trust in a hard-to-reach population. Furthermore, using the mosque as a venue enables participants due to the low barrier of entry. Being able to offer counselling and materials in one’s own language empowers them and enables them to take charge of their own health. Moreover, the participant can decide what they want to do and what they want to change in their lifestyle.

In terms of Education and training, the intervention itself is training: the participants are trained to change their lifestyle to prevent the development of chronic diseases. Participants acquire skills they can practice in real life, both from the app and the group meetings. They decide by themselves what kind of changes they are able and willing to make into their everyday life at the moment.

The volunteer workers were trained to do the measurements according to research guidelines. The results of the intervention will also benefit nurses working in maternity and child health care clinics, who find it hard to give lifestyle counselling to patients from immigrant backgrounds, and this adapted smartphone application could help them as well.

**16. Summary**

The purpose of this pilot action was to create and test a lifestyle intervention model for an immigrant population group and to improve the risk identification and participation of the target population by making the intervention culturally acceptable and taking the intervention near to the people. The general objectives were to improve access to diabetes preventive services by underserved population and among them, to increase awareness on diabetes risk factors and adoption of healthy lifestyles through culturally adapted promotion and prevention activities.

The intervention was based on available StopDia model. Intervention was culturally adjusted and delivered in participants’ own language, by a researcher who herself is a member of the community. Also the evaluation measurements were completed by trained volunteer health care students from the community. About 90 persons filled in the FINDRISC to get an estimate of their future risk of diabetes, 33 (37%) were at increased risk and 24 (18 women and 6 men, 73% of those at increased risk) agreed to participate in the 12-week, 6-meeting group counselling lifestyle intervention. In addition, they were provided with a digital application to support adoption of healthy behaviours (BitHabit).

Interest to take part in the screening was high among the target population. Moderate positive changes in some of the health measurements were achieved among the participants such as improved general diet, increased consumption of vegetables, and increased physical activity. Participants were generally very satisfied with the conduct and content of the intervention, but they would have wished for a longer follow-up time. Benefits for the participants included improved access to preventive care by individuals with high type 2 diabetes risk, improved knowledge on healthy lifestyle, and improved diet and physical activity behaviours.

The involvement of several stakeholders was vital for the action. It would not have been possible without collaboration with and commitment by the Somali community members, including the imam. The necessary cultural and linguistic adjustments were completed by a Somali researcher, in collaboration with the members from the Somali community. The StopDia model owners (University of Eastern Finland, VTT Technical Research Centre of Finland, Finnish Institute for Health and Welfare) collaborated to provide the training to the researcher and the volunteer health care students, as well as provided the up-keeping for the digital application. The strengths of the pilot include evidence- and theory-based intervention model; culturally adjusted intervention that was taken close to the target population; inclusion of the target group members into planning and implementation of the intervention; and holistic approach to healthy lifestyles.

**17. Interpretation**

The impact of the intervention was assessed quantitatively with clinical and lifestyle measures taken before and after the intervention and by measuring screening and intervention participation rates. T2D screening conducted in the mosque, a place familiar to the target population, proved to be a feasible way to identify immigrant people at increased risk, who would benefit from lifestyle counselling.

As we considered including a non-treatment control group unethical in this setting, we rely the evaluation of the intervention effects on the pre and post measurements. The downside is that without a control group, we cannot claim that the possible changes achieved during the intervention are actually the result of the intervention.

Data on participants’ perspectives on the intervention suggest that they were very satisfied with the concept and content of the intervention model. Modest improvements in lifestyle behaviours were achieved, which could have a large impact in longer-term. The magnitude of the achieved changes was similar as compared with other implementation studies, especially when conducted among minority groups[[8]](#footnote-8).

**18. Limitations**

Since the pilot was a proof-of-concept study, it did not rely on power calculations and we did not have a comparison group. The scheduling of the group meetings was challenging and timetable that would have suited everybody could not be reached. In the future, the groups could include people with similar life situations, in order to make scheduling easier. An important limitation was that we were not able to take and measure blood samples, as the measurements were completed in the premises of the mosque. Therefore, we were also not able to diagnose diabetes or other conditions that would require medical attention. In the future, collaboration with the local primary health care services should be established, in order to offer these measurements to the participants. Finally, the sustainability of the pilot has not been ensured, even though the local stakeholders have expressed their interest to support this kind of activities in the future. We are at the moment preparing the scientific reports of the pilot, and will continue the dissemination activities.

**19. Conclusions**

The pilot proved to be a feasible model to provide risk screening and prevention interventions to an underserved population group. If scaled-up, it could have an important effect also as regards to health disparities between population groups.

The co-created T2D prevention intervention model could be transferred to other Somali communities in Finland and other countries, but would require close collaboration with the target population as well as training of the local implementers. Same intervention could be feasible, after adjustment and translation, for other immigrant groups and would benefit people with other risk factors also, not just those who are at high type 2 diabetes risk. For sustainability and scale-up, interplay and collaboration between health care services and preventive intervention providers should be secured.

The JA CHRODIS Recommendations (QCR tool) provided a feasible and practical framework for the designing and implementing the pilot. It steered focus on the whole picture at the beginning of the project and forced to ponder the practical details in advance. The JA CHRODIS recommendations and criteria is a comprehensive set: if you follow it you can be assured that you are not missing important aspects.

**20.** **Funding**

The pilot was co-funded by CHRODIS Plus and the StopDia project, which in turn got its funding from the Finnish Academy’s Strategic Research Council. The Helsinki Islamic Center (the mosque) offered the facilities for the risk screening and interventions free-of-charge. Also the health care students worked as volunteers, with no compensation.

Obligatory Annexes:

Annex 1: Individual pilot action plan

Annex 2: Intermediary evaluation report

Annex 3: Study visit report

Annex 4: Final evaluation report

Annex 5: Barriers, Enablers and Suggestions for future implementations

Annex 6: Sustainability and Replicability/Transferability

Annex 7: Essential elements of pilot action report

*Other Annexes may include additional material produced during JA CHRODIS PLUS and is important to reflect the core characteristics of the pilot action.*

## Annex 5: Barriers, Enablers and Suggestions for future implementations (maximum 2 pages)

|  |  |  |  |
| --- | --- | --- | --- |
| **Quality Criteria and Recommendations** | **Barriers** | **Enablers** | **Suggestions for future Implementations** |
| **1. Practice design** | Attending lifestyle group meetings was not always possible for the participants due to different life situations. | The practice was based on scientific evidence and theory. It was co-created with representatives from the target population. All materials used were culturally adjusted and translated into Somali language, and the meetings were held in a place that was familiar to the target population. | In the future, similar approach could be useful also for other immigrant groups. Attendance could improve if participants were recruited for example from their work or study place. They would have similar life situations and the coordination of meetings would be less difficult |
| **2.Target population empowerment** | In average, the participants attended 50% of the group sessions (3/6). | Participants were free to choose what kind of changes they made to their diet and lifestyle.  Digital application reinforces target population empowerment. | The practice depends highly on commitment from members of the target community (volunteers, group counsellor) which could be a challenge if such persons cannot be found. |
| **3. Evaluation** | We had no control group and were not able to take blood samples. | Pre and post measurements were conducted in the mosque, which facilitated participation. | Closer collaboration with health care services would enable measurements of e.g. blood samples. |
| **4. Comprehensiveness of the practice** | We could not take blood samples and thus were not able to e.g. measure blood glucose to diagnose T2D. | Holistic approach to healthy lifestyles; the same intervention can reduce the risk of many other chronic conditions in addition to T2D. | Immigrant people often have higher risk factor levels but are under-represented in preventive activities. Special models like this are needed to meet their needs. |
| **5. Education and training** |  | All materials were translated and culturally adjusted. | There is a demand for linguistically and culturally adjusted lifestyle intervention materials also for other immigrant groups. The materials developed in this context would be useful not only for T2D prevention but also for general promotion/prevention activities. |
| **6. Ethical considerations** |  |  | Co-creation with the target group is the key to success, to ensure cultural suitability.  People with immigrant background are at increased risk and it would be unethical not to provide them preventive services that are available for general population. |
| **7. Governance** | Regardless our efforts we were not able to engage local primary health care services to support our pilot while it was ongoing. | Collaboration with the target community. | The practice depends highly on commitment from members of the target community (volunteers, group counsellor) which could be a challenge if such persons cannot be found. |
| **8.Interaction with regular and relevant systems** | Lack of collaboration with primary healthcare and municipalities. |  | Potentially engage municipalities and/or health care systems |
| **9.Sustainability and scalability** | Lack of funding after project has ended. | Satisfaction and enthusiasm by all stakeholders, including the intervention participants. | The intervention model could potentially be scaled up to other Somali communities and other immigrant groups. |

## Annex 6: Sustainability and Replicability/Transferability (maximum 4 pages)

**The continuation of the practice has been ensured through institutional anchoring and/or ownership by the relevant stakeholders or communities:**

Your pilot action results and experiences: At the moment the continuation of the practice has not been ensured. There was a common appreciation of the pilot among the stakeholders and interest to continue, but we have not found a body that would be willing to take the responsibility of the scale-up. We have continued the discussions with relevant NGOs and health care service providers.

**The sustainability strategy considered a range of contextual factors (e.g. health and social policies, innovation, cultural trends and general economy, epidemiological trends).**

Your pilot action results and experiences: We have created a model for the practice, taking into account the contextual factors, but so far have no sustainability strategy.

**There is broad support for the practice amongst those who implemented it**

Your pilot action results and experiences: The support from those who implemented the practice was enthusiastic. The volunteers as well as the researcher from the community were happy that they were able to “give something back” to their own people and share their knowledge.

**Potential impact on the population targeted (if scaled up) is assessed.**

Your pilot action results and experiences: The potential impact could be substantial, as this is a population group who have not been provided with preventive services before, even though they (especially women) are at high risk. Improvements were seen in diet and physical activity, and the general feedback from the pilot participants was excellent.

**Stakeholder’s involvement: describe the involvement of beneficiaries, institutions and actors important for the development and continuation of the activities beyond the implementation;**

Your pilot action results and experiences: The practice was co-created with members from the target community and depends highly on their commitment.

**Replicability/Transferability : a successful transferability of the practice maybe facilitated by a clear definition of the context, sustainability, intersectorality and participation of stakeholders .**

Your pilot action results and experiences: As a result of the pilot, we have a tested strategy on how to co-create an intervention model to efficiently identify individuals at risk and to provide lifestyle counselling that could be feasible also for other immigrant groups. While increasing the participants’ self-efficacy and level of knowledge, the intervention may also produce meaningful improvements in diet and physical activity behaviours and as a result, reduce risk of chronic diseases such as T2D and decrease health disparities.

## Annex 7: Essential elements of pilot action report (maximum 2 pages)

Please describe the component(s) of the **Quality Criteria and Recommendations** implemented:

|  |
| --- |
| * Practice design * Target population empowerment * Education and training * Ethical considerations |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **General objective:**  To create and implement a culturally sensitive lifestyle intervention model to improve health and wellbeing and prevent type 2 diabetes among an underserved immigrant population group | **Process Indicators** | **Outcome**  **Indicators** | **Outcome**  **Indicators** | **Sources of information** |
|  | **Baseline**  (incl. year)  12/2018 | **Current value**  (incl. date/year)  4/2019 |  |
| **Specific Objectives**  SO1: To improve risk screening and access to diabetes preventive activities through participation by Somali underserved population  SO2: To improve awareness on diabetes risk factors and adoption of healthy lifestyles through culturally adapted promotion and prevention activities | 18 women and 6 men at increased T2D risk were identified and recruited in the lifestyle intervention pilot. | Diet quality score at baseline 45.4±14.3  Average steps per day at baseline 3771±2866 | Diet quality score at follow-up 49.5±12.1  Average steps per day at follow-up 4568±2080 | -Project log  - Group intervention log  - BitHabit user log  - Clinical measurements before and after the intervention  - Nutrition and lifestyle questionnaire  - Accelerometer data |
| **Activities (change package)**  **SO1**:  - Translating the FINDRISC T2D risk score to Somalian language  - Establishing collaboration with the Somali community  - Enrolling volunteer Somali health care students  - Acquiring ethical clearance  - Organizing T2D risk screening events in the mosque  - Recruitment of lifestyle intervention participants | KP1: 4 risk screening events organized  KP2: Somali-speaking researcher and 11 volunteers trained  KP3: ~ 90 persons assessed with the FINDRISC, 33/90 at increased risk, 24/33 participated in the intervention |  |  | - Meeting reports  - Ethical clearance document  - FINDRISC T2D risk score in Somalian  - Information leaflet on the study & consent form |
| SO2:  - Revising and translating the Stop Diabetes lifestyle intervention materials to fit culturally the target population  - Training the Somali-speaking researcher on how to conduct the intervention  -Training the volunteer students on how to do the measurements  -Conducting the baseline measurements  - Conducting the intervention  -Conducing the follow-up measurements | KP4: 6 group meetings over 10 weeks organized, separately for men and women  -16/18 women and 6/6 men finished the pilot.  - Participation rate in group meetings was 50%  -80% started to use the BitHabit app  KP5: Baseline measurement conducted for 24/24 persons and follow-up measurements conducted for 22/24 persons | Diet quality score at baseline 45.4±14.3  50% eating >1 portions of vegetables per day  Waist circumference at baseline 106.2±94  Systolic blood pressure at baseline 119±18  Average steps per day at baseline 3771±2866 | Diet quality score at follow-up 49.5±12.1  80% eating >1 portions of vegetables per day  Waist circumference at follow-up 105.5±11.3  Systolic blood pressure  at follow-up 117±15  Average steps per day at follow-up 4568±2080 | -Measurement manual & slide set  - Instructor manual, Workbook for participants, and BitHabit digital lifestyle support application in Somalian language  -Project log  - Group intervention log  - BitHabit user log  - Clinical measurements data  - Nutrition and lifestyle questionnaire  - Accelerometer data |

Summarize the **major Barriers and Enablers** identified during the implementation of the **Quality Criteria and Recommendations** (*Annex 5)*

* **Enablers:** 
  + **Evidence-and theory-based intervention model; culturally adjusted intervention that was taken close to the target population; inclusion of the target group members into planning and implementation of the intervention; holistic approach to healthy lifestyles**

**Barriers:**

* **Lack of a control group**
* **Group intervention schedule was not suitable for all participants**
* **There was no possibility to measure blood glucose for evaluation, as the activities were conducted in the mosque (without laboratory facilities or personnel)**
* **Sustainability could not be ensured due to lack of continuous funding and a stakeholder that would manage the intervention model**

INAL .......s for future Sustainability and Replicability and Please describe the major **Results of the Implementations** (*from section 16.Summary of Individual pilot action report*):

**-Benefits for Patients / participants**  (improved access to care, health status and quality of life):

* **Improved access to risk screening and preventive activities by individuals with increased type 2 diabetes risk**
* **Improved knowledge on healthy lifestyles**
* **Improved diet and physical activity behaviours among the intervention participants**

**-Stakeholders and Policy Makers Involvement and Actions:**

* **The collaboration with and commitment by the Somali community are the keys to successful implementation**
* **Cultural and linguistic adjustment as well as development and training as a collaborative action by stakeholders are needed to achieve a successful intervention**

**Suggestions for future Implementations,** **Sustainability and Replicability/Transferability of the Quality Criteria and Recommendations** (*from section 19. Conclusions of Individual pilot action report, Annex 5, Annex 6)***:**

* **Type 2 diabetes prevention intervention model could be transferred to other Somali communities in Finland and other countries. It will require close collaboration with the target population as well as training of the local implementers**
* **The same intervention could be feasible, after adaptation, for other immigrant groups. In addition, the intervention could be beneficial not only for people at increased risk for type 2 diabetes, but also on a population having other risk factors**
* **It is important to establish collaboration between health care services and preventive intervention providers as well as other stakeholders**

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