7 A community health worker intervention to reduce cardiovascular disease and complications in the diabetic population of Mexico

Summary

The "Tools and practices to reduce cardiovascular disease (CVD) and complications in the diabetic population of Mexico" study sought to evaluate the impact of Meta Salud Diabetes (MSD), a behavioural intervention aiming to reduce clinical risk factors for developing CVD among diabetic populations. MSD is based on behavioural change theories working to increase understanding of the disease and empower patients to manage their condition. The study was funded by the US National Institutes of Health (NIH) as part of the second GACD call for proposals focussed on diabetes.

As part of the project implementation, the team worked closely with regional healthcare centres in the Mexican state of Sonora. Following the 13-week period during which the MSD intervention was introduced to patient groups, the project team found that **the intervention reduced the risk of cardiovascular disease and led to behavioural changes: study participants consumed fewer for sugary drinks and more vegetables**.

A pilot in Arizona yielded similar results to the Sonora trial. Together, the results showed that the **MSD intervention can be successfully deployed as a cost-effective strategy to reduce the risk of CVD**, especially in low-resource environments and among patients with controlled type 2 diabetes.

Based on the successful deployment of MSD, the research team secured additional funding from the US National Institutes of Health (NIH) and Mexico's CONACYT to continue piloting the MSD intervention in other areas in Mexico, the USA and Benin, including scale-up activities in the state of Sonora.

7.1 Background

In 2015, non-communicable diseases (NCDs) accounted for around 80% of deaths in Mexico.[139] Between 2006 and 2016, the prevalence of diabetes increased by nearly 31%, and now affects 9.4% of the population. Diabetes and cardiovascular disease account for around 250,000 deaths. Factors driving these trends are overweight and obesity: the estimated prevalence of overweight and obese adults (20+ years) was 72.5% in 2016, up from 61.8% in 2000. Individuals with diabetes are two to six times more likely to die from cardiovascular disease (CVD) than non-diabetics. Risk factors for developing CVD among diabetics include obesity, high blood pressure, high cholesterol and smoking. Prevention of modifiable risk factors for CVD is hence of key importance for lowering premature death rates in Mexico.

Health promotion interventions have been shown to have a positive impact on health behaviours and to contribute to the prevention and control of NCDs.[140] However, research underpinning this evidence often relies on conditions created in the context of clinical trials,

[139] Aceves B, Ingram M, Nieto C et al (2020) Non-communicable disease prevention in Mexico: policies, programs and regulations. Health promotion international, 35(2), 409–421. https://doi.org/10.1093/heapro/daz029, and references within

[140] Bauer UE, Briss PA, Goodman RA, Bowman BA. (2014) Prevention of chronic disease in the 21st century: elimination of the leading preventable causes of premature death and disability in the USA. Lancet. 384:45–52. doi: 10.1016/S0140-6736(14)60648-6

which include resources to ensure staffing, training, recruitment, incentives, and even adequate facilities and materials to implement the intervention. Real-world settings lack access to these resources. Successful implementation hence requires an understanding of contextual factors and finding solutions – suited to the local context – that facilitate the eventual adoption and scale up of the intervention.

7.2 The award

The "Tools and Practices to Reduce CVD and Complications in the Diabetic Population of Mexico" study was funded by the US National Institutes of Health (NIH) through the second GACD call for proposals focussed on diabetes (2016-2021; 1R01HL125996-01[141]).

The project aimed to facilitate prevention and management of CVD and related complications that can emerge among adults with type 2 diabetes. One major component of the study assessed the effectiveness of an adapted evidence-based community health worker intervention, Meta Salud Diabetes (MSD). MSD is a 13-week intervention to reduce behavioural and clinical risks for cardiovascular disease among adults with diabetes. The second component was an implementation study that involved systematic engagement of local, state and national decision makers.

The project was led by Dr Cecilia Rosales from the University of Arizona in collaboration with El Colegio de Sonora and was implemented in Sonora, Mexico. The state of Sonora was chosen due to higher rates of mortality among patients with diagnosed CVD.[142] The project team worked with 22 Grupos de Ayuda Mutua (GAM), patient support groups, in government-run health centres (Secretaría de Salud) in Sonora. The project team also worked with the Ministry of Health and Mexican government which had an interest in interventions that could be widely deployed in the country and promote a healthy lifestyle and provide patients with the knowledge and tools to manage the CVD-related risks. The project sought to contribute towards building capacity among health centres to combat CVD and diabetes more effectively in the population.[143]

The project approach was based around introducing healthcare workers to the MSD intervention. On receiving training on the application of MSD, the healthcare workers were expected to be better equipped to reduce clinical and behavioural risk for cardiovascular disease among adults with type 2 diabetes. The MSD intervention itself is grounded in behavioural change theories (Trans Theoretical Model of Behaviour Change and Social Cognitive Theory) that targets both physical activity and education to both improve knowledge about the condition and management of diabetes. The approach also leverages the sense of community within the support groups to strengthen participation of individuals through an increased sense of belonging to a group with a common goal.[143]

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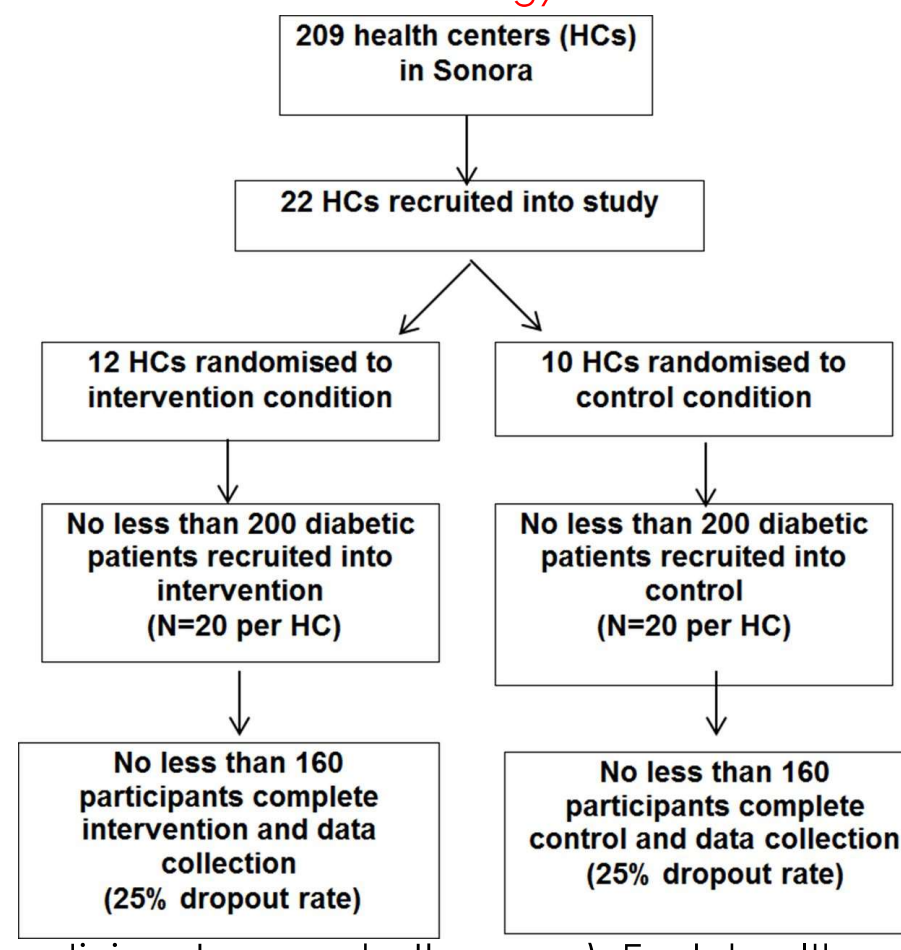
[141] Project 1R01HL125996-01, Tools and Practices to Decrease CVD and Complications in the Diabetic Population of Mexico. Available via https://reporter.nih.gov

[142] Project report from GACD annual scientific meeting: 2020 ASM Projects updates. 2020

[143] Rosales C. B. et al. (2018). Meta Salud Diabetes study protocol: a cluster-randomised trial to reduce cardiovascular risk among a diabetic population of Mexico. Available at: https://bmjopen.bmj.com/content/8/3/e020762

Overview of trial methodology



The first component of the study was a cluster-randomised trial among adult patients with diabetes sampled from 22 government-run health centres in Sonora. GAM personnel (nurses and community health workers) at the health centres were randomised to the intervention and received training on the use of the MSD intervention. The centres were randomly divided into a control group (10 centres) and intervention group (12 centres). The health centres enrolled participants diagnosed with either controlled or uncontrolled diabetes.[144] A total of 518 diabetes patients participated in the project, of which 225 were in the control group and 293 in the intervention group (the project had an 83% retention rate for participants across both groups). Each health centre had at least 20 patients participating in the project.

Patient clinical data was collected at the start of the intervention. Data collection also included three surveys with the intervention and control groups (after the first session, last session and 9 months after the end of the programme) which, beyond the patient clinical data, was also used to measure behavioural changes (changes to nutrition, physical activity, etc.).[144]

In the second component of the project, the study team piloted the MSD intervention in 2 Federally Qualified Health Centres in Arizona. This pilot served two purposes, firstly to provide additional data validation opportunities by comparing the results from Sonora to those from Arizona; and secondly to contribute towards the scale-up of the intervention.[145]

In order to facilitate future scale-up, the project team also conducted an implementation study to determine the feasibility of wider deployment of the intervention, both in the state of Sonora and across other regions in Mexico. This analysis included stakeholder meetings and interviews with policy makers.[146]

The project was granted a no-cost extension to extend the project for one year as a result of complications arising from the COVID-19 pandemic. [147]

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[144] ClinicalTrials.gov (2021). Tools And Practices To Decrease CVD And Complications In The Diabetic Population Of Mexico. Available at: https://www.clinicaltrials.gov/ct2/show/study/NCT02804698

[145] Rosales C. B. et al. (2018). Meta Salud Diabetes study protocol: a cluster-randomised trial to reduce cardiovascular risk among a diabetic population of Mexico. Available at: https://bmjopen.bmj.com/content/8/3/e020762

[146] Rosales C. B. (2020). Tools and Practices to Decrease CVD and Complications in the Diabetic Population of Mexico. Available at: https://arizona.pure.elsevier.com/en/projects/tools-and-practices-to-decrease-cvd-and-complications-in-the-diab

[147] Project report from GACD annual scientific meeting: 2020 ASM Projects updates. 2020

7.3 Outputs, outcomes, impacts

By 2021 all the training sessions had been conducted and all the surveys had been completed. Comparative analysis between the intervention and control groups included comparing the Framingham Risk Score (to measure the risk of CVD) and the Diabetes Distress Scale (to measure the patient wellbeing). The following are the main research results:

- The intervention group, when compared to the control group, had a 3.17% lower risk of CVD within 3 months and 2.13% lower risk within 12 months[147]
- Patients with controlled type 2 diabetes had a higher success rate in lowering the risk of CVD. Men had greater success with lowering the risk of CVD compared to women[147]
- Participating patients reduced consumption of sugary drinks and increased consumption of vegetables which shows positive impacts on patient lifestyle choices[148]
- The MSD intervention did not have an impact on patients' hypertension levels[148]

The Arizona pilot yielded similar results to the Sonora trial. Together, the results showed that the MSD intervention can be successfully deployed as a cost-effective strategy to reduce the risk of CVD, especially in low-resource environments and among patients with controlled type 2 diabetes.[147]

The GAM personnel also responded positively to the intervention and the training opportunities to develop new skills for CVD prevention. However, when the project closed, the MSD intervention was not maintained at the participating health centres due to lack of official recognition for the MSD intervention and the requirement for the health centres to maintain official government prevention programmes which were already running on a tight schedule.[149]

One of the underlying reasons for mixed results in the healthcare centres was the general focus on treatment rather than prevention. As such, the level of institutional support for the project varied from centre to centre. While centres were eager to send personnel for training, GAM groups were excluded from institutional plans. GAM personnel thus did not have any incentive to work with the MSD intervention. The success of the intervention was thus reliant on the individual enthusiasm of GAM personnel.[150]

7.4 Potential for future impact

The project team has acquired supplemental funding from NIH and CONACYT to continue piloting the MSD intervention in other areas in Mexico, the USA and even Benin. The deployment in Mexico is being carried out in region VI of the state of Sonora as part of scale-up efforts.[151]

The success of the scale-up and sustainability of the project in part depends on the capacity for continued MSD training and assistance. At least the scale-up in Sonora is addressing this already with 19 new trainees in region VI trained by the project team.[152]

Beyond the trained individuals, for MSD to be a sustainable intervention requires:

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[148] Catalina A. et al. (2020). DM17 Tools and Practices to Reduce CVD and Complications in the Diabetic Population of Mexico. Available at: https://www.gacd.org/perch/resources/4dm17.pdf

[149] Ingram M. et al (2019). The Meta Salud Diabetes Implementation Study: Qualitative Methods to Assess Integration of a Health Promotion Intervention Into Primary Care to Reduce CVD Risk Among an Underserved Population With Diabetes in Sonora, Mexico. Available at: https://www.frontiersin.org/articles/10.3389/fpubh.2019.00347/full#h9

[150] Ibid

[151] Project report from GACD annual scientific meeting: 2020 ASM Projects updates. 2020

[152] Ibid

- Institutional support – this is already being addressed by the continued involvement of Secretaría de Salud in the scale-up of the intervention
- Staff capacity – trainers, support staff as well as GAM personnel who would be guiding the patients in the use of the MSD intervention are required. While the question of trainers is being addressed, availability of GAM personnel appears to be a continuing challenge as the workload at health centres means reduced institutional capacity to deploy MSD

Future uptake of the MSD intervention by GAM personnel will also require MSD to be officially recognised by the Secretaría de Salud and made a permanent part of the services provided by health centres where GAM personnel are active. Furthermore, incentives are required to expand the GAM programme and recruit patients to participate in the MSD intervention. [153]

[153] Project report from GACD annual scientific meeting: 2020 ASM Projects updates. 2020