

LETTERS TO THE EDITOR

Potential economic values of an effective physical activity and nutrition program to prevent type 2 diabetes mellitus and hypertension in Vietnam: an opportunity for the scale-up of interventions

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Trial-based identification of effective interventions in a Vietnamese population is important to provide policy makers with scientific evidence to support good decision-making. However, the information these trials provide often requires additional data to fully estimate the benefit of the intervention in the longer term. Here, we provide an example which demonstrates the potential value of extending data collection, a conclusion we believe to generalise across many of the trials currently being undertaken in Vietnam.

Recently, the author team has reported widely on the efficacy of an intervention addressing Metabolic Syndrome (MetS) in Ha Nam province [1-4]. Briefly, the Vietnam Physical Activity and Nutrition (VPAN) intervention was a 6-month two-arm cluster-randomised controlled trial of a community-based physical activity and dietary behaviour intervention targeting adults aged 50-65 years with MetS. The intervention consisted of four education sessions, an information booklet (covering exercise and diet advice), a resistance band, and walking groups established in each

commune to promote physical activity. A group leader for each commune was nominated by its group members, receiving a manual for managing the group walks, and attended three 2-hour training sessions on promoting physical activity in prevention of MetS and how to manage a walking group. After 6 months, the intervention participants showed significant improvements in physical activity and nutrition outcomes, including reductions in intake of animal internal organs and in using cooking oil for daily meal preparation [4] as well as anthropometric measures and parameters of MetS [1] after controlling for demographic and other confounding factors. A reduction in MetS was found in both intervention and control groups ($p < 0.001$), decreasing to 56.0% and 75.9%, respectively, and was significantly lower among the intervention participants ($p < 0.001$) [1].

However, this demonstration of efficacy in reducing type 2 diabetes mellitus and cardiovascular diseases development is a necessary but not sufficient condition for broader uptake. There are two major barriers

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that need to be overcome before policy makers can implement efficacious policies (such as VPAN, but also other similar studies showing promising short-term findings in small groups). The first of these is a demonstration of the ability to scale up the intervention to address a larger (ideally) national population. If a country does not have the capacity to do so, then implementation first needs these constraints to be addressed. A related issue to this is the possibility that the efficacy results from a smaller trial will not generalise across sub-populations, defined by geography, ethnicity, socio-economic status and rurality. In testing the scalability of an intervention to a broader population, its efficacy across different types of people should be rigorously explored.

The second barrier is to identify whether the intervention is cost-effective. By that, we mean that the benefit derived from the intervention exceeds what could otherwise be achieved if the resources used were employed in another way [5]. Ideally, this results in a cost per quality-adjusted life year (QALY), a measure that reflects both changes in quality of life and in length of life [6]. Economic evaluation recognises that public funding of an intervention will prevent something else being funded, and we need to be confident that the new intervention will provide more benefit than the one it displaces. We estimate that the VPAN intervention costs 289,000VND per participant, consisting of 50,000VND for the booklet, 127,000VND for the education sessions, 50,000VND for the resistance bands, and 62,000VND for the walk leaders' training and incentives. We believe that, given the significant reduction in MetS from the intervention, reducing by 44.0% of MetS in the intervention group, that this is likely to be a good use of resources. However, we cannot prove this as we do not know the value of preventing MetS in terms of quality of life or delaying death. To reliably extrapolate short-term outcomes into the longer-term requires longer follow-up of participant trajectory into the future. This will allow robust estimates concerning the transition between MetS and diabetes, and then the resultant increased mortality risk. From a cost perspective, World Health Organisation data estimates the

meand diabetes-related expenditure per person (aged 20-79) with diabetes in Vietnam to be \$US217 (4.94 Million VND as of May 2018) [7]. In addition, total estimated direct costs of hospitalisation for hypertension only per Vietnamese person were \$US65, relatively high compared to the total health expenditure per capita in Vietnam [8]; thus, if longer-term follow-up may identify a quantifiable reduction in diabetes and hypertension incidence, there is the potential for a significant cost offset associated with reducing MetS. However, to make such a case to policy makers, we need to undertake the work to characterise the health trajectory of participants in highly promising programs such as the VPAN.

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