Commentary

Identifying actionable lifestyle risk factors for obesity research and intervention: Challenges and opportunities for Pacific Island health researchers

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In *The Lancet Regional Health – Western Pacific*, Frayon and colleagues assess sociodemographic and lifestyle risk factors for overweight and obesity among adolescents in New Caledonia [1]. The prevalence of adolescent overweight and obesity is high and growing across Pacific Island Countries and Territories (PICTs) [2]. Wide variation in risk among countries and among ethnic groups, such as elevated risk among Melanesian and Polynesian adolescents in New Caledonia, points to the importance of studies assessing diverse samples that could highlight shared risk factors to inform population-wide interventions, and patterns specific to each group that might guide more tailored interventions and clinical practice.

Unfortunately, the identification of key actionable lifestyle risk factors is no clear-cut endeavor, a problem that is certainly not unique to PICTs. As evidenced from the results in New Caledonia, even well-designed studies with large and diverse samples often identify only modest effects of lifestyle variables on obesity risk. Risk factors vary among studies, and a great deal of variance is left unexplained. Several issues underlie these challenges.

First, interactions among risk factors complicate the identification of individual predictors of obesity. The list of obesity risk factors is long, and each factor explains only a small percentage of variance. Analyses of isolated behavioral and sociodemographic characteristics might not detect modest individual contributions of each variable. Risk is exacerbated when multiple variables, such as socioeconomic status, screen time, and dietary patterns, interact [3]. However, interaction analyses require precise assessment of a wide array of variables among very large samples – a challenge in any region, including PICTs.

Second, social and economic transitions play a major role in obesity risk that is not necessarily reflected in variance in individual characteristics. For example, globalization of capitalism has contributed to substantial lifestyles changes in PICTs, especially in terms of food availability and consumer preferences, as well as a dual burden of early undernutrition and later overnutrition [4,5]. These upstream factors shape and constrain individual health behaviors. As such, interventions that target individuals are less likely to be effective in the absence of policies that address the root causes of health behavior change [5].

Third, as suggested by the authors, the impact of lifestyle risk factors on obesity risk will vary based on individual predisposition. Genetic influences [6], the prenatal environment [7], early undernutrition [4], and the microbiome[8] are but a few examples of factors that predispose some adolescents to obesity and that might exacerbate effects of individual behaviors that, for adolescents without predisposition, might have little relationship with obesity risk.

Finally, cultural perceptions of acceptable body size affect health behaviors, and ideas about what constitutes a healthy body among Pacific populations are complex and changing [9,10]. Body fatness may be perceived as more acceptable or desirable among Melanesian or Polynesian youth, and youth might alter health behaviors in function of their perceptions of body size. Cultural norms and community context related to diet and activity patterns also influence the likelihood of behavior change [9]. Cross-cultural analyses of obesity risk factors are complicated by systematic differences in body norms and the social context of food and exercise.

These challenges help to clarify the relatively modest relationships between lifestyle variables and obesity risk observed in many studies of adolescent obesity, including the New Caledonia study [1]. For example, Frayon and colleagues found that most dietary

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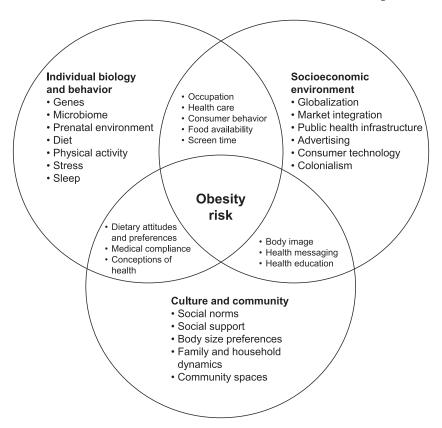   *E-mail address:* dancause.kelsey_needham@uqam.ca (K.N. Dancause).

Fig. 1. Conceptual model of interacting individual, cultural, political, and economic factors that shape obesity risk across the life course.

patterns were not consistent predictors of overweight and obesity. Sleep duration and screen time, key risk factors identified in many other studies, were not systematically associated with overweight and obesity in all groups. The authors rightly note that results highlight the possibility of a genetic influence that might be stronger than that of the lifestyle variables assessed. That said, like sociobehavioral risk factors, the effect of singular genetic factors is generally small [11]. The modest impact of lifestyle factors and the ethnic differences observed calls for consideration of intersecting individual, cultural, political, and economic factors that shape obesity risk across the life course (Fig. 1).

Recognition of these challenges by no means diminishes the need for diverse studies of sociobehavioral risk factors. As reported by Frayon and colleagues, risk factors such as low sleep duration among European adolescents, and dietary patterns suggestive of skipping breakfast among Melanesian and Polynesian adolescents, provide meaningful targets for interventions that hold benefits for not only obesity, but many other aspects of well-being. Given the potential long-term health risks of adolescent obesity, even small reductions in prevalence via modification of these lifestyle traits could have widespread public health implications.

An appreciation of the complex interplay between obesity risk factors highlights the importance of continued discourse between clinical and epidemiological researchers on how to translate multi-level risk factors into interventions, especially in resource-poor settings that are common in PICTs. Interventions are more likely to be successful if they are long-term, multi-faceted, and culturally appropriate. In adolescents, integration of family and household members is important to effect lasting change. Furthermore, given that Pacific Islanders tend to exhibit greater lean mass than Europeans irrespective of BMI [10], studies combining clinical and epidemiological data remain necessary to inform our evaluations of population-specific obesity cut-offs for estimating disease risk

among the diverse populations in PICTs and the specific meaning of BMI-based obesity in a primary care setting.

Ultimately, we need more interdisciplinary work to allow us to merge analyses of lifestyle and sociodemographic traits with individual predisposition and the broader cultural, political, and economic environment. A challenging but important next step for those of us conducting obesity research in PICTs might be the creation of an open-access PICT health data repository to facilitate secondary analysis across existing studies, and to promote coordination in study design among obesity researchers to allow for direct comparison of variables among larger samples. High-quality studies of lifestyle and sociodemographic characteristics among diverse samples, such as that of Frayon and colleagues, provide a starting point for the development of these interdisciplinary endeavors in PICTs.

Declaration of Interests

The authors declare no conflicts of interest.

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