Global Health Promotion

Official Publication of the International Union for Health Promotion and Education

Publication officielle de l'Union internationale de Promotion de la Santé et d'Education pour la Santé

Publicación oficial de la Unión Internacional de Promoción de la Salud y Educación para la Salud

Volume 31 Number 4 December 2024

https://journals.sagepub.com/home/ped
ISSN 1757-9759

Global Health Promotion

Global Health Promotion (ISSN: 1757-9759 print, 1757-9767 online) is published four times a year in March, June, September and December by Sage, 1 Oliver's Yard, 55 City Road, London EC1Y 1SP, UK.

Subscriptions

Annual subscription (2024): Institutional Rate (electronic only) £422/US$780. Note VAT is applicable at the appropriate local rate. Visit sagepub.com for more details, including individual rates, single-copy rates and pay per view. Abstracts, tables of contents and contents alerts are available online free of charge for all. Further details are available from Sage Publications Ltd., 1 Oliver's Yard, 55 City Road, London EC1Y 1SP, UK, tel. +44 (0)20 7324 8500, email: subscriptions@sagepub.co.uk, and in North America, Sage Publications Inc., 2455 Teller Road, Thousand Oaks, California 91320, USA.

All members of IUHPE have access to *Global Health Promotion*.

Printed in the United Kingdom.

Global Health Promotion (ISSN : 1757-9759 imprimé, 1757-9767 en ligne) est publié quatre fois par an, en mars, juin, septembre et décembre, par Sage, 1 Oliver's Yard, 55 City Road, London EC1Y 1SP, Royaume-Uni.

Abonnements

Abonnement annuel (2024) : Tarif institutionnel (accès électronique uniquement) 422 £/780 US$. Remarque : la TVA est applicable au tarif local qui convient. Pour plus de détails, notamment concernant les tarifs individuels, les tarifs pour exemplaires uniques et l'accès ponctuel à un article particulier, visitez sagepub.com. Les résumés, tables des matières et alertes de contenus sont disponibles en ligne pour tous, gratuitement. Plus de détails peuvent être obtenus auprès de Sage Publications Ltd., 1 Oliver's Yard, 55 City Road, London EC1Y 1SP, Royaume-Uni, tél. +44 (0)20 7324 8500, e-mail : subscriptions@sagepub.co.uk, et en Amérique du Nord, Sage Publications Inc., 2455 Teller Road, Thousand Oaks, California 91320, États-Unis.

Tous les membres de l'UIPES ont accès à *Global Health Promotion*.

Imprimé au Royaume-Uni.

Global Health Promotion (ISSN: 1757-9759 impresa, 1757-9767 edición digital) es publicada cuatro veces al año (marzo, junio, septiembre y diciembre), por Sage, 1 Oliver's Yard, 55 City Road, London EC1Y 1SP, UK.

Suscripciones

Suscripción anual (2024): Tarifa institucional £422/US$780. El IVA se aplica de acuerdo con las tasas locales. Para información detallada sobre tasas individuales, tarifas para un solo número o de pago por consumo, consulte la página sagepub.com. Los resúmenes, índices y alertas de contenidos están disponibles en línea, de forma gratuita. Si desea más información, puede contactar a Sage Publications Ltd., 1 Oliver's Yard, 55 City Road, London EC1Y 1SP, UK; teléfono: +44 (0)20 7324 8500; correo electrónico: subscriptions@sagepub.co.uk. En Norteamérica: Sage Publications Inc., 2455 Teller Road, Thousand Oaks, California 91320, USA.

Todos los miembros de la UIPES tienen acceso a *Global Health Promotion*.

Impresa en el Reino Unido.

IUHPE – UIPES

INTERNATIONAL UNION FOR HEALTH PROMOTION AND EDUCATION
UNION INTERNATIONALE DE PROMOTION DE LA SANTÉ ET D'ÉDUCATION POUR LA SANTÉ
UNIÓN INTERNACIONAL DE PROMOCIÓN DE LA SALUD Y EDUCACIÓN PARA LA SALUD

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Health promotion must be(come) equality promotion

Ted Schrecker

'Polycrisis' (1) has a good claim to status as the word of the decade, in a world beset by such phenomena as the fallout from the worst pandemic in a century; heightened geopolitical uncertainty and its economic impacts; and human-induced climate change and other disturbing manifestations of the Anthropocene Epoch. Yet another crisis, rising inequality, has drawn relatively less attention, although it compromises or eliminates the chances for large segments of the population to lead healthy lives.

In 2014, the then-managing director (CEO) of the International Monetary Fund (IMF) described the growth in inequality worldwide as 'staggering' and warned that '[i]f we are not careful, the ghosts of the 19th century will haunt the 21st century' (2). Although the organization she led had over the decades done much to contribute to that pattern, she was correct, and the subsequent decade provided abundant evidence that the haunting she anticipated is already happening (3, chapter 3; 4).

Health promotion research and practice have yet to adequately take on board the consequences of this pattern. Concepts like health literacy that presume individuals have the material resources needed to lead a healthy life are of limited relevance, to put it politely, to populations like:

- The 2.8 billion of the world's people who could not afford a healthy diet in 2022, according to the United Nations agency with responsibility for food security (5, p. xix);
- The 3.8 million people in the United Kingdom (UK) who experienced destitution, 'where people cannot afford to meet their most basic physical needs to stay warm, dry, clean and fed' (6) in 2022, up from 1.55 million in 2017 (7);
- The estimated 800,000 United States (US) urban residents who lacked a piped water connection between 2013 and 2017 (8), after cost increases associated with a decade of privatization and austerity.

The landmark 2008 report of the WHO Commission on Social Determinants of Health focussed attention on the 'toxic combination of poor social policies and programmes, unfair economic arrangements, and bad politics' (9, executive summary) that creates and entrenches such inequalities. The situations identified by the Commission and the damage they do to health result from policy choices on various levels. They did not just happen. Thomas Piketty, the author of the magisterial *Capital in the Twenty-First Century* (10), and a colleague have put it this way:

> Inequality does not follow a deterministic process . . . There are powerful forces pushing alternately in the direction of rising or shrinking inequality. Which one dominates depends on the institutions and policies that societies choose to adopt. (11, pp. 842–843)

These institutions and policies have included domestic initiatives like the infamous 1996 welfare reforms in the US (12) and a decade of destructive austerity in the UK (13), as well as international initiatives such as trade agreements that have devastated the manufacturing industry (14). Lowered barriers to cross-border financial flows have increased inequality within countries (15) and facilitated tax avoidance by transnational corporations and the ultra-wealthy (16). Such policies are sometimes framed as responses to a global economic environment that leaves few alternatives, especially for low- and middle-income countries. In response, it is essential both to identify the policies that created that environment, notably

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Global Health Promotion 1757-9759; Vol 31(4): 3–5; 1291010 DOI: 10.1177/17579759241291010 journals.sagepub.com/home/ghp

the decades of conditionalities attached to loans from the IMF that prioritized integrating national economies into global systems while protecting creditors in the high-income world (17, p. 261), and to recognize the role of governments in promoting globalization despite its domestically disequalizing consequences. As an especially thoughtful historical sociologist of global development puts it:

> The discourse of globalization emphasizes the necessity of governments to adapt to newness and difference, a necessity that forecloses choice. But government policies are designed, not to adapt to new circumstances, but to promote them. (18, p. 224)

An important 2010 article captured the tension between such realities and the dominant focus in health promotion on individual behaviour and 'choice' in terms of 'lifestyle drift – the tendency for policy to start off recognizing the need for action on upstream social determinants of health only to drift downstream to focus largely on individual lifestyle factors' (19). Against this trend, a renewed focus on inequality and its drivers is essential if health promotion is not to drift into irrelevance. At a minimum, public health and health promotion curricula must incorporate material on the connections between public policy, including public finance, and health inequality (as mine did before I retired).

Beyond the classroom, transitions away from lifestyle drift and towards engagement with macro-scale variables may be especially difficult. Job descriptions may preclude them; employers may be indifferent if not hostile, as may research granting councils whose decisions can advance or terminate research careers. A further complication is introduced when those who insist that public health policies be evidence-based unreflectively adopt the standards and methods of clinical epidemiology. Such demands obscure abundant evidence from multiple disciplines of the importance of social determinants of health (20, 21) and facilitate or excuse inaction through 'epidemiological inertia' (22). Efforts like longstanding documentation by public health authorities in Ottawa, Canada's national capital, of the impossibility of eating a healthy diet while reliant for income on several categories of benefits (23) are promising. But much, much more is needed.

Declaration of conflicting interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author received no financial support for the research, authorship, and/or publication of this article.

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La promotion de la santé doit être (ou devenir) la promotion de l'égalité

Ted Schrecker

Le terme « polycrise » (1) est en bonne place pour revendiquer le titre de mot de la décennie, dans un monde assailli par des phénomènes tels que les répercussions de la pire pandémie survenue en un siècle ; l'incertitude géopolitique accrue et ses impacts économiques ; et le changement climatique provoqué par l'homme ainsi que les autres manifestations préoccupantes de l'ère de l'Anthropocène. Pourtant, une autre crise, celle de la montée des inégalités, a attiré relativement peu l'attention alors qu'elle compromet ou anéantit les chances d'une grande partie de la population de mener une vie saine.

En 2014, la Directrice générale du Fonds monétaire international (FMI) a décrit la montée des inégalités dans le monde comme étant « ahurissante », en soulignant que « [s]i nous n'y prenons pas garde, les spectres du 19ème siècle vont hanter le 21ème » (2). Même si l'organisation qu'elle dirigeait alors a grandement contribué à ce schéma au cours des décennies, elle avait raison, et la décennie suivante a fourni de nombreux éléments indiquant que la présence de ces spectres qu'elle avait anticipée est déjà une réalité (3, chapitre 3;4).

La recherche et la pratique de la promotion de la santé doivent tenir compte des conséquences de ce schéma, et ce, de manière adéquate. Des concepts comme la littératie en santé, qui supposent que les individus disposent des ressources matérielles nécessaires pour mener une vie saine, ont une pertinence limitée, pour le dire poliment, pour des populations telles que :

- les 2,8 milliards de personnes dans le monde qui n'ont pas eu les moyens de manger sainement en 2022, selon l'agence des Nations unies chargée de la sécurité alimentaire (5, p. xix) ;
- les 3,8 millions de personnes au Royaume-Uni qui ont connu la pauvreté, « lorsque les personnes n'ont pas les moyens de satisfaire leurs besoins physiques élémentaires pour rester au chaud, sec, propre et nourri » (6), en 2022, alors qu'elles étaient 1,55 millions en 2017 (7) ;
- les quelques 800.000 résidents urbains aux États-Unis qui ont été privés d'un raccordement à l'eau courante entre 2013 et 2017 (8), suite à une hausse des coûts associée à une décennie de privatisation et d'austérité.

Le rapport phare de la Commission de l'OMS sur les déterminants sociaux de la santé de 2008 a attiré l'attention sur la « combinaison toxique de politiques et de programmes sociaux médiocres, de mesures économiques injustes et de mauvaises stratégies politiques » (9, résumé analytique) qui crée et consolide ces inégalités. Les situations identifiées par la Commission et les torts qu'elles causent à la santé résultent de choix politiques à différents niveaux. Elles ne sont pas apparues comme ça. Thomas Piketty, auteur de l'ouvrage magistral intitulé *Le capital au XXIe siècle* (10), et un collègue l'ont formulé de la façon suivante : « L'inégalité ne suit pas un processus déterministe. . . . Il existe des forces puissantes qui poussent alternativement dans la direction d'augmenter ou de réduire l'inégalité. La domination de l'une ou de l'autre va dépendre des institutions et des politiques que les sociétés vont choisir d'adopter » (11, pp. 842–843).

Ces institutions et ces politiques incluent les initiatives locales, comme la tristement célèbre réforme du système d'aide sociale de 1996 aux États-Unis (12) et une décennie d'austérité destructrice au Royaume-Uni (13), de même que les initiatives internationales comme les accords commerciaux qui ont dévasté l'industrie manufacturière (14). La diminution des obstacles aux

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Global Health Promotion 1757-9759; Vol 31(4): 6–8; 1297580 DOI: 10.1177/17579759241297580 journals.sagepub.com/home/ghp

flux financiers transfrontaliers a accru les inégalités au sein des pays (15) et facilité l'évitement fiscal pour les sociétés transnationales et les ultra-riches (16). De telles politiques sont parfois définies en réponse à un environnement économique mondial qui laisse peu d'alternatives, en particulier dans les pays à faibles et moyens revenus. Par conséquent, il est essentiel d'identifier les politiques qui créent cet environnement, notamment les décennies de conditions rattachées aux prêts du FMI qui priorisaient l'intégration des économies nationales dans les systèmes mondiaux tout en protégeant les créditeurs des pays à revenus élevés (17, p. 261), et de reconnaître le rôle des gouvernements dans la promotion de la mondialisation en dépit des inégalités qu'elle génère à l'échelle nationale. Comme le dit une sociologue historique du développement mondial particulièrement attentive : « Le discours de la mondialisation met l'accent sur la nécessité pour les gouvernements de s'adapter à la nouveauté et à la différence, une nécessité qui exclut le choix. Cependant, les politiques gouvernementales sont élaborées non pas pour s'adapter à de nouvelles circonstances, mais pour les promouvoir » (18, p. 224).

Un important article de 2010 a décrit la tension entre de telles réalités et l'accent mis de façon prépondérante par la promotion de la santé sur le comportement individuel et le « choix » en utilisant le terme de « dérive du style de vie – la tendance des politiques à partir de la reconnaissance de la nécessité d'agir sur les déterminants sociaux de la santé en amont pour finalement dériver en aval et se concentrer largement sur les facteurs du style de vie individuel » (19). Face à cette tendance, il serait crucial de mettre à nouveau l'accent sur les inégalités et leurs causes, si la promotion de la santé ne veut pas dériver vers une absence de pertinence. À tout le moins, les programmes de santé publique et de promotion de la santé devraient intégrer du matériel sur les connexions entre les politiques publiques, y compris de finances publiques, et les inégalités de santé (comme ce fut le cas du mien avant que je prenne ma retraite).

Au-delà de la salle de classe, les transitions pour s'éloigner de la dérive du style de vie et se diriger vers un engagement avec des variables macro-échelle pourraient s'avérer extrêmement difficiles. Les descriptions de poste pourraient les exclure ; les employeurs pourraient y être indifférents, si pas hostiles, tout comme les conseils subventionnaires de la recherche, dont les décisions sont susceptibles de faire progresser les carrières scientifiques ou d'y mettre fin. Une autre complication survient aussi lorsque ceux qui insistent pour que les politiques de santé publique soient fondées sur des données probantes adoptent sans y penser les normes et les méthodes de l'épidémiologie clinique. De telles exigences masquent les nombreuses données issues de multiples disciplines sur l'importance des déterminants sociaux de la santé (20,21) et facilitent ou excusent l'inaction au travers d'une « inertie épidémiologique » (22). Certains efforts sont prometteurs comme, par exemple, la documentation sur une longue période par les autorités de santé publique d'Ottawa, la capitale nationale du Canada, de l'impossibilité d'avoir une alimentation saine lorsque les revenus dépendent de plusieurs catégories de bénéfices (23). Mais cela est très loin d'être suffisant.

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La promoción de la salud debe convertirse en promoción de la igualdad

Ted Schrecker

La 'Polycrisis' (1) puede reclamar el estatus de 'palabra de la década' en un mundo acosado por fenómenos como los que se derivaron de la peor pandemia vivida en un siglo, la gran incertidumbre geopolítica y sus impactos económicos, y el cambio climático inducido por el hombre, entre otras manifestaciones perturbadoras de la época del Antropoceno. Otra crisis más, la creciente desigualdad, ha suscitado una relativa menor atención a pesar de que compromete o elimina las posibilidades de que grandes segmentos de la población tengan una vida saludable.

En el 2014, la entonces directora gerente del Fondo Monetario Internacional (FMI) describió el crecimiento de la desigualdad como "pasmoso" y advirtió que "si no tenemos cuidado, los fantasmas del siglo XIX rondarán el siglo XXI" (2). Aunque la organización que lideró contribuyó bastante a ese patrón durante décadas, ella tenía razón, y el decenio siguiente proporcionó abundante evidencia de que el acecho que ella anticipó ya está ocurriendo (3, capítulo 3; 4).

La investigación y la práctica de la promoción de la salud aún no han tenido en cuenta de manera adecuada las consecuencias de ese patrón. Conceptos como el alfabetismo para la salud, que supone que las personas cuentan con los recursos materiales necesarios para llevar una vida saludable, son de limitada relevancia – por decirlo educadamente – para poblaciones como:

- los 2 800 millones de personas en el mundo que no podían permitirse una dieta saludable en el 2022, según la agencia de las Naciones Unidas responsable de la seguridad alimentaria (5, p. xix);
- los 3.8 millones de personas en el Reino Unido que experimentaron indigencia, "que no pueden satisfacer sus necesidades físicas más básicas para mantenerse calientes, secas, limpias y alimentadas" (6) en el 2022, frente a 1.55 millones en el 2017 (7);
- unos 800 000 residentes urbanos de Estados Unidos que carecían de una conexión de agua potable entre el 2013 y el 2017 (8), después de los incrementos de los costos asociados a una década de privatización y austeridad.

El informe histórico del 2008 de la Comisión sobre Determinantes Sociales de la Salud, de la OMS, centró la atención en la "nefasta combinación de políticas y programas sociales deficientes, arreglos económicos injustos y una mala gestión política" (9, resumen analítico) que origina y consolida tales desigualdades. Las situaciones identificadas por la Comisión y los daños que causan a la salud resultan de las decisiones políticas en varios niveles. No sucedieron por casualidad. Thomas Piketty, autor del magistral *El capital en el siglo XXI* (10), y un colega, lo plantearon de este modo: "La desigualdad no sigue un proceso determinista. (. . .) Hay fuerzas poderosas que empujan de manera alterna hacia el aumento o la reducción de la desigualdad. Cuál predomina dependerá de las instituciones y políticas que las sociedades decidan adoptar" (11, pp. 842–843).

Estas instituciones y políticas incluyen iniciativas domésticas como las tristemente famosas reformas de bienestar social de 1996 en Estados Unidos (12) y una década de austeridad destructiva en el Reino Unido (13), además de iniciativas internacionales como los acuerdos comerciales que han devastado a la industria manufacturera (14). La reducción de

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Global Health Promotion 1757-9759; Vol 31(4): 9–11; 1297506 DOI: 10.1177/17577592412975O6 journals.sagepub.com/home/ghp

barreras a los flujos financieros transfronterizos ha incrementado la desigualdad entre los países (15) y ha facilitado la evasión fiscal de las corporaciones transnacionales y los ultrarricos (16). En ocasiones, estas políticas se plantean como reacción a un entorno económico mundial que deja pocas alternativas, en especial para los países de ingreso bajo y mediano. En respuesta, es esencial identificar las políticas que crearon ese entorno, particularmente las décadas de condicionalidades vinculadas a los préstamos del FMI que priorizaron la integración de las economías nacionales dentro de los sistemas mundiales al tiempo que protegían a los acreedores de altos ingresos (17, p. 261), y reconocer el papel de los gobiernos en la promoción de la globalización a pesar de sus consecuencias de desigualdad doméstica. Como lo manifestó un sociólogo histórico del desarrollo mundial especialmente reflexivo: "El discurso de la globalización enfatiza la necesidad de los gobiernos para adaptarse a la novedad y a la diferencia, una necesidad que excluye la elección. Sin embargo, las políticas gubernamentales están diseñadas no para adaptarse a las nuevas circunstancias, sino para promoverlas" (18, p. 224).

Un artículo importante del 2010 capturó la tensión entre tales realidades y el enfoque dominante en la promoción de la salud sobre el comportamiento individual y la "elección" en términos de "la 'deriva del estilo de vida', la propensión de las políticas a empezar reconociendo la necesidad de actuar sobre los determinantes sociales de la salud desde su origen, y cambiar luego de rumbo para enfocarse principalmente en los factores individuales del estilo de vida" (19). Contra esta tendencia, es esencial volver a enfocarse en la desigualdad y sus causas para que la promoción de la salud no derive hacia la irrelevancia. Como mínimo, los currículos de salud pública y de la promoción de la salud deben incluir un material sobre las conexiones entre políticas públicas que integre las finanzas públicas y la desigualdad en salud (como lo hacía el mío, antes de mi retiro).

Más allá del aula, las transiciones desde la deriva del estilo de vida hacia el compromiso con variables a gran escala pueden ser especialmente difíciles. La descripción de los puestos de trabajo puede descartarlas, los empleadores pueden ser indiferentes si no hostiles, al igual que los consejos que subvencionan la investigación, cuyas decisiones pueden impulsar o poner fin a las carreras de investigación. Una complicación adicional se presenta cuando quienes insisten en que las políticas de salud pública se basen en la evidencia adoptan sin reflexionar los estándares y los métodos de la epidemiología clínica. Esas propuestas ocultan bastante evidencia procedente de múltiples disciplinas sobre la importancia de los determinantes sociales de la salud (20,21) y facilitan o excusan la inacción mediante la 'inercia epidemiológica' (22). Son prometedores los esfuerzos como el que vienen realizando desde hace tiempo las autoridades de salud pública de Ottawa, capital nacional de Canadá, para documentar la imposibilidad de seguir una dieta saludable cuando se depende de varias categorías de prestaciones para obtener ingresos (23). Pero se necesita más, mucho más.

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Original Article

A preliminary analysis of "Passport to Practice": investigating development of core competencies in undergraduate health promotion students

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Abstract:

Background: Equipping tertiary health promotion students with skills and knowledge to contribute meaningfully to the health promotion workforce begins with enhancing their health promotion competence via well-designed curriculum. This includes a focus on work-integrated learning, global citizenship, professional identity and competency mapping in line with the International Union for Health Promotion and Education Core Competencies and Professional Standards for Health Promotion.

Methods: In this paper we report baseline results for the Passport to Practice project, a mixed-methods prospective cohort study to track undergraduate health promotion student progress across their degree, to evaluate a new approach for assessing student achievement of the Competencies and Standards developed by the International Union for Health Promotion and Education. Baseline data were collected from first-year students via document analysis of student reflection papers ($n = 40$); and an online survey ($n = 29$) to measure self-reported health promotion competence, development of global citizenship and professional identity, and PebblePad usability.

Results: Findings suggest the Passport to Practice initiative positively contributed to professional identity and health promotion competence. Students appreciated work-integrated learning opportunities that enabled them to plan for future activities to address gaps in their competence; and students excelled in the social responsibility dimension of global citizenship but lagged in the political voice category of the global civic engagement dimension.

Conclusion: Findings provide insights about strategies and concepts required to equip students with the skills and knowledge required for their role as health promotion practitioners to address complex public health challenges.

Keywords: capacity building, education, health promotion, workforce development, public health, evaluation, qualitative, quantitative

Introduction

The development and application of core competencies to support health promotion university education, practitioners and organizations have proliferated over the past four decades (1). Core competencies for health promotion are generally agreed as the 'the minimum set of competencies that constitute a common baseline for all health promotion roles' (2, p.3). Recently, health promotion has been strengthened as a discipline and profession via the International Union for Health Promotion and Education (IUHPE) Health Promotion Accreditation System (3), which provides educational accreditation and practitioner

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(This manuscript was submitted on 11 September 2023. Following blind peer review, it was accepted for publication on 15 January 2024.)

Global Health Promotion 1757-9759; Vol 31(4): 27–36; 1230065 DOI: 10.1177/17579759241230065 journals.sagepub.com/home/ghp

registration based upon agreed criteria. The IUHPE Core Competencies and Professional Standards for Health Promotion (4) (Competencies and Standards herein) underpin the curriculum of courses accredited by IUHPE and are used by health promotion practitioners globally. The Competencies and Standards include nine domains (Enable Change; Advocate for Health; Mediate through Partnership; Communication; Leadership; Assessment; Planning; Implementation; Evaluation and Research) underpinned by ethical values and knowledge.

Curtin University's Bachelor of Science (BSc) in Health Promotion was the first Australian course (degree/programme of study) to receive IUHPE accreditation (3). The three-year undergraduate course was established in 1987 and teaching staff have historically used competencies to guide course refinement and capture theory-to-practice knowledge transfer (5). Various methods have been used, including an evidence guide (6) or portfolio (5) to map competency development; reflective writing via an e-portfolio (7); and a long-running 'Passport to Practice' incorporating activities based on work-integrated learning (WIL) principles (8). In 2019, the course underwent renewal to prepare for re-accreditation by revising alignment with the Competencies and Standards (9). Areas identified for improvement were global citizenship, embedded practical activities, and professional identity.

Preparing students for health promotion practice includes developing their capacity to contribute meaningfully as global citizens (10). Global Citizenship Education (11) embeds global orientation and citizenship concepts and assessments into the curriculum (12). Dimensions of global citizenship are coterminous with health promotion competencies, specifically: social responsibility, global competence and global civic engagement (13). Good curriculum design focusing on global citizenship can enhance the likelihood that students will graduate with necessary skills to address complex public health challenges (10).

Professional identity is vital to how health promotion is understood, practised and advanced as a discipline and profession (11). Professional identity has been defined as 'the formation of an attitude of personal responsibility regarding one's role in the profession, a commitment to behave ethically and morally, and the development of feelings of pride for the profession' (14, p.686). WIL and theory-to-practice approaches contribute to professional identity (15). Biehl and colleagues (16) have argued that professional identity formation can support professional roles in health promotion and that universities play a vital role in this.

To support enhanced WIL, professional identity and competency development, Passport to Practice was embedded across the course in 2021 (previously described in detail (9)). Briefly, the assessment series links three units (single subjects within a course (degree)) providing students with WIL opportunities and authentic assessments aligned with the Competencies and Standards and a focus on professional identity (17). Students map skills and knowledge against the Competencies and Standards in each unit, and participate in and reflect on practical co-curricular activities to emulate continuing professional development requirements for practitioner registration (18). Assessment is supported by PebblePad, an online platform used as a competency-based portfolio system for evidencing student achievements, experiences and skills (19).

The Passport to Practice research project aims to evaluate the new approach for assessing student achievement of the Competencies and Standards by following student progression across three years. This research has the following objectives: (i) examine student development of perceptions, awareness, knowledge and skills toward the Competencies and Standards; (ii) measure student development of global citizenship and professional identity; (iii) evaluate the utility of PebblePad; and (iv) provide a framework for undergraduate teaching and assessing the Competencies and Standards. This paper is a report of the baseline methods and results.

Methods

In this section we outline the methods for year 1 of a mixed-methods prospective cohort study (Table 1), led by two teaching and research academics involved in designing and delivering the BSc in Health Promotion. Units that are part of the study are:

- HLPR1000 Health Promotion Principles and Values: first-year unit introducing students to the principles and values of health promotion as a theoretical foundation for contemporary practice, policy and research;

Table 1. Study design.

Data type	*Year 1 (2021 + 2022)*	*Year 2 (2022 + 2023)*	*Year 3 (2023 + 2024)*
Qualitative	• HLPR1000 document analysis	• HLPR2000 document analysis • Student focus groups	• HLPR3002 document analysis • Student focus groups • Staff focus group
Quantitative	• Student survey	• Student survey	• Student survey

- HLPR2000 Health Promotion in Action: second-year unit providing a practical introduction to the design, implementation and evaluation of health promotion interventions;
- HLPR3002 Health Promotion Leadership and Identity: third-year unit providing a professional capstone to synthesize degree theoretical and practical content.

Participant recruitment

Students commencing their studies in 2021 and 2022 in a single or double (Health and Safety or Nutrition) Health Promotion or Health Sciences (incorporating Health Promotion units) undergraduate degree and enrolled in HLPR1000 (2021: $n = 53$; 2022: $n = 64$) were invited to participate in year 1 of the study.

Data collection

Student survey

Students were invited to complete an online survey utilizing Qualtrics via announcements posted in the learning management system. Questions collected demographic information and enrolment status (adapted from Wold *et al.* (20)); health promotion competence; global citizenship; professional identity; and PebblePad usability. Psychometrics of the adapted instruments utilized were not rechecked because of previous validity and reliability testing, as described below. Additionally, the instrument was piloted with third-year health promotion students to enhance face and content validity (21).

Health promotion competence

Students self-rated their current knowledge and skills in the Competencies and Standards by indicating their level of agreement using five-point Likert scales (strongly agree to strongly disagree) against statements comprising descriptions of each domain. For example, 'I have the knowledge and skills required to enable change (domain 1): "Enable individuals, groups, communities and organizations to build capacity for health promoting action to improve health and reduce health inequities."' Open-ended questions asked students to describe units and practical activities contributing to their knowledge and skill development.

Global citizenship

Items were included from the Global Citizenship Scale, which has been tested for face validity, exploratory and confirmatory factor analyses, and nominal group technique to verify the scope of the global citizenship construct (13). Students indicated their level of agreement with 28 statements using five-point Likert scales (strongly disagree to strongly agree) across three dimensions: social responsibility (global justice and disparities, altruism and empathy, global interconnectedness and personal responsibility); global competence (self-awareness, intercultural communication, global knowledge); and global civic engagement (involvement in civic organizations, political voice, global civic activism). Two items were removed from the global civic engagement section which related to short-term overseas travel plans due to international border closures in Australia during the COVID-19 pandemic.

Professional identity

The Macleod Clark Professional Identity Scale (22) was used to measure professional identity, which demonstrated predictive validity among undergraduate nursing students. The instrument

items were adapted to include the term 'health promotion' as the profession and nine statements exploring feelings of belonging to and positively identifying with the health promotion profession were included. Students indicated their level of agreement with the statements using five-point Likert scales (strongly disagree to strongly agree). For example, 'I feel I have strong ties with members of the health promotion profession'. Each item was scored between 1 and 5 to provide a total score between 9 and 45 across nine items. Higher scores indicate higher self-reported professional identity.

PebblePad usability

PebblePad usability was assessed using the System Usability Scale (SUS) (23), a 10-item instrument used to test online platforms using five-point Likert scales (strongly disagree to strongly agree). For example, 'I found the various functions in PebblePad were well integrated'. The SUS has demonstrated excellent reliability (coefficient alpha > 0.90), validity and sensitivity for measuring usability (24). Open-ended questions provided additional comments regarding PebblePad use.

Document analysis

All students enrolled in HLPR1000 submit reflection papers as part of an assessment to map competency development. Students were invited to provide consent for their reflection to be included in the study after the assessment had been submitted and graded, and marks released. Identifiable information was removed by researchers after document extraction.

Data analysis

Quantitative data were analysed in SPSS (25) and descriptive statistics were generated. The SUS scoring protocol was implemented for PebblePad usability data, whereby item scores were summed for each participant, out of 100. The average score was calculated and categorized as follows: $\geqslant 80 = A$; 70–79 = B; 60–69 = C; 50–59 = D; and $\leqslant 50 = F$. Mean scores were calculated for Likert scale items in the Global Citizenship Scale and the Macleod Clark Professional Identity Scale (1 = strongly disagree, 3 = neutral, 5 = strongly agree). Mean scores for negatively worded items were calculated using inverse scale values. Qualitative data were managed using NVivo (26) and directed content analysis was conducted (27) using the Competencies and Standards as a framework. Data triangulation was carried out to corroborate the qualitative and quantitative results (28).

Ethical considerations

The Curtin University Human Research Ethics Committee approved the study (HRE2021-0169). Participants provided informed consent and students were advised that non-participation would not affect their enrolment status. Because this research involved university teaching staff, all data were initially analysed by an independent Project Officer. Results were reviewed by primary researchers.

Results

Survey sample

Table 2 summarizes baseline demographic characteristics, comprising 10 students in 2021 (18.9% response) and 19 students in 2022 (29.7% response). The majority were women ($n = 27$, 93.1%), born in Australia ($n = 17$, 58.6%), in 2000 or later ($n = 13$, 44.8%), grew up in a major city ($n = 19$, 65.5%), living with their parents ($n = 16$, 55.2%), domestic students (n=28, 96.6%), enrolled in the BSc Health Promotion ($n = 16$, 55.2%) and studying full time ($n = 15$, 51.7%). Because of the small sample size, differences between demographic groups were not analysed for the survey results.

Health promotion competence

Table 3 summarizes baseline health promotion competence. Students rated themselves highest in enable change (58.3% agreement) and communication (70.9% agreement); and lowest in implementation (58.3% disagreement) and evaluation and research (62.5% disagreement).

Global citizenship

Table 4 summarizes baseline global citizenship results. The mean score for social responsibility was 4.3. Mean scores for global competence were 3.1

Table 2. Baseline survey sample demographic characteristics ($N = 29$).

Variable	*n (%)*
Year of birth	
1970–1979	5 (17.2)
1980–1989	3 (10.3)
1990–1999	8 (27.6)
2000 onwards	13 (44.8)
Gender	
Man	2 (6.9)
Woman	27 (93.1)
Location growing up	
Regional	10 (34.5)
Major city	19 (65.5)
Country of birth	
Australia	17 (58.6)
Other	12 (41.4)
Living arrangements	
Parent's home	16 (55.2)
Share house	1 (3.4)
Own home	8 (27.6)
Partner's home	3 (10.3)
Other	1 (3.4)
Student type	
Domestic	28 (96.6)
International	1 (3.4)
Course	
BSc Health Promotion	16 (55.2)
BSc Health Promotion, BSc Health and Safety	1 (3.4)
BSc Nutrition, BSc Health Promotion	6 (20.7)
BSc Health Sciences	6 (20.7)
Enrolment status	
Full time	15 (51.7)
Part time	14 (48.3)

(self-awareness), 4.0 (intercultural communication) and 3.8 (global knowledge). Mean scores for global civic engagement were 3.2 (involvement in civic organizations), 2.8 (political voice) and 3.6 (global civic activism).

Professional identity

Table 5 summarizes baseline professional identity results. The total score for the sample was 32.4 out of 45.

PebblePad usability

Participant SUS scores ranged from 37.5 (F) to 85 (A) with a mean score of 62 (C), indicating average perceived PebblePad usability. Some participants felt comfortable with the platform once they 'got the hang of it' and found it 'user-friendly'; whereas other participants found it 'really tedious and confusing' and not overly intuitive.

Document analysis

Student reflections in 2021 ($n = 21$) and 2022 ($n = 19$) are reported under two domains: 1) perceptions of health promotion knowledge; and 2) development of knowledge and skills within core competencies.

Perceptions of health promotion knowledge

Students' health promotion knowledge varied from 'holistic and in-depth' to 'fundamental aspects' only. Students indicated that increased knowledge led to better understanding, particularly 'solidifying concepts such as social justice and human rights' and involvement in group presentations improved understanding of health promotion models and approaches.

Practical activities also contributed to increased knowledge. Volunteering, 'contributing to projects', 'networking with peers' and attending industry events influenced this:

> 'Working alongside health promotion practitioners [as a volunteer] has helped me gain more knowledge and transferable skills that help me be a good health promotion practitioner.' (Student, 2022)

Development of knowledge and skills within core competencies

First-year health promotion foundations acquired informed knowledge required as practitioners 'in a real-world setting' but exposed knowledge gaps, for example:

> 'Although I feel I have learnt a sizeable amount, I am not even close to meeting an entry level health

Table 3. Baseline health promotion competence ($N = 24$).

	Disagree *n (%)*	*Neutral* *n (%)*	*Agree* *n (%)*	*I don't know* *n (%)*
Enable change	6 (25.0)	2 (8.3)	14 (58.3)	2 (8.3)
Advocate for health	6 (25.0)	4 (16.7)	13 (54.2)	1 (4.2)
Mediate through partnership	6 (25.0)	9 (37.5)	8 (33.3)	1 (4.2)
Communication	4 (16.7)	3 (12.5)	17 (70.8)	
Leadership	7 (29.2)	4 (16.7)	13 (54.2)	
Assessment	12 (50.0)	5 (20.8)	5 (20.8)	2 (8.3)
Planning	12 (50.0)	4 (16.7)	8 (33.3)	
Implementation	14 (58.3)	3 (12.5)	6 (25.0)	1 (4.2)
Evaluation and research	15 (62.5)	3 (12.5)	5 (20.8)	1 (4.2)

promotion standard, which requires a skillset to plan, implement, and evaluate interventions.' (Student, 2021)

Consistent with survey findings, students reported greatest comfort with communication, predominantly acquired via existing workplace experience or activities such as cultural and diversity training, social media, industry events and reading journal articles. Students not meeting this competency identified lack of workplace experience or working with people from different cultures. Planning, by comparison, was a competency only some students reported meeting, acquired through studies and assessments.

Many students were working toward competencies to advocate for health, enable change and mediate through partnership. Activities supporting these included: volunteering with health organizations, using social media to expand networks, attending health promotion webinars, and becoming a student mentor.

'I felt empowered. . . as I was able to learn how activities match up to health promotion principles and bring those principles to action' (Student, 2022)

Students were less likely to report meeting evaluation and research or implementing partnerships with stakeholders domains. Many students indicated these would be subsequently achieved by learning to evaluate health promotion campaigns, developing research skills, contributing to a project and volunteering. Students reporting development of these competencies highlighted volunteering as a research assistant and learning how to use software such as Nvivo and Endnote as activities that contributed to their learning.

Most students indicated that skills to implement effective and efficient, culturally sensitive, and ethical Health Promotion action in partnership with stakeholders would be further developed. Activities identified as contributing to development included completing diversity courses and subsequent implementation of the strategies in their current workplace. No students reported meeting or working toward the assessment competency.

Discussion

In this paper we presented baseline findings from a cohort study assessing the effect of an updated undergraduate Health Promotion course on first-year student learning. The revised course includes enhanced WIL opportunities (8); self-reflection; competency mapping; and a greater emphasis on global citizenship and professional identity. Changes aim to better prepare students for the workforce through strategies demonstrated to have utility (15). Results provide insights into the first year of the course and implementation of the Passport to Practice initiative.

First-year students reported feeling most confident in communication but least confident in evaluation and research. The initial year serves as a foundation for

Table 4. Baseline global citizenship ($N = 15$).

	Mean score
Social responsibility	
I think that most people around the world get what they are entitled to have[a]	4.3
It is okay if some people in the world have more opportunities than others[a]	4.1
I think that people around the world get the rewards and punishments they deserve[a]	4.1
In times of scarcity, it is sometimes necessary to use force against others to get what you need[a]	4.1
The world is generally a fair place[a]	4.1
I think that many people around the world are poor because they do not work hard enough[a]	4.9
Global competence (self-awareness)	
I know how to develop a place to help mitigate a global environmental or social problem	2.7
I know several ways in which I can make a difference on some of this world's most worrisome problems	3.1
I am able to get other people to care about global problems that concern me	3.6
Global competence (intercultural communication)	
I unconsciously adapt my behaviour and mannerisms when I am interacting with people of other cultures	3.7
I often adapt my communication style to other people's cultural background	4.0
I am able to communicate in different ways with people from different cultures	4.3
Global competence (global knowledge)	
I am informed of current issues that impact international relationships	4.0
I feel comfortable expressing my views regarding a pressing global problem in front of a group of people	4.1
I am able to write an opinion letter to a local media source expressing my concerns over global inequalities and issues	3.3
Global civic engagement (involvement in civic organizes)	
Over the next six months, I will participate in a walk, dance, run or bike ride in support of a global cause	3.5
Over the next six months, I plan to get involved with a global humanitarian organize or project	3.1
Over the next six months, I plan to help international people who are in difficulty	3.1
Over the next six months, I plan to get involved in a programme that addresses the global environmental crisis	3.1
Over the next six months, I will work informally with a group toward solving a global humanitarian problem	2.9
Over the next six months, I will pay a membership or make a cash donation to a global charity	3.7
Global civic engagement (political voice)	
Over the next six months, I will contact a newspaper or radio to express my concerns about global environmental, social or political problems	2.6
Over the next six months, I will express my views about international politics on a website, blog or chat room	3.0
Over the next six months, I will contact or visit someone in government to seek public action on global issues and concerns	2.7
Over the next six months, I will participate in a campus forum, live music, or theatre performance or other event where young people express their views about global problems	3.1
Global civic engagement (global civic activism)	
If at all possible, I will always buy fair-trade or locally grown products and brands	3.9
I will deliberately buy brands and products that are known to be good stewards (caretakers) of marginalized people and places	3.9
I will boycott brands or products that are known to harm marginalized (disempowered) global people and places	2.9

[a]Negatively worded questions.

Table 5. Baseline professional identity ($N = 15$).

Social responsibility	*Mean score*
I feel like I am a member of the health promotion profession	3.1
I feel I have strong ties with members of the health promotion profession	2.9
I find myself making excuses for belonging to the health promotion profession[a]	4.7
I try to hide that I am studying to be part of the health promotion profession[a]	4.7
I am pleased to belong to the health promotion profession	4.5
I can identify positively with members of the health promotion profession	4.1
Being a member of the health promotion profession is important to me	4.1
I feel I share characteristics with other members of the health promotion profession	4.3
Total	32.4

[a]Negatively worded questions.

health promotion values and principles, with subsequent years focusing on competency domains like assessment, implementation, and evaluation and research. Early exposure to the fundamentals reportedly enhanced student understanding of health promotion's complexity and the role of a health promotion practitioner (16), aligning with established evidence (29). We posit comparing findings with second- and third-year data will help differentiate between 'entry to practice' and 'expert' competency levels (1).

Summative assessment alone falls short in evaluating competency achievement and fostering reflective practice and professional development, which is vital to the role of a health promotion practitioner (30). Instead, as demonstrated in this study, scaffolding competencies across the course and fostering a sense of progression via sequential and authentic assessment supports competency attainment (31). This also provides students with opportunities to engage with stakeholders, understand ethical principles and develop research and evaluation skills (31).

Findings suggest Passport to Practice positively contributes to professional identity. Using competencies in this context may strengthen professional identity by clarifying the roles and functions of health promotion practitioners (1,32) and encouraging students to examine the broader health promotion sector and their future roles (29). In addition, student cohorts developing and progressing together over time can also strengthen professional identity formation (15).

Experiential learning exposes students to professional health promotion behaviours, strengthening problem-solving and decision-making skills (32). Co-curricular and reflection activities aligned with the Competencies and Standards lay the foundation for continuing professional development requirements for Registered Health Promotion Practitioners (18). Results indicate that students appreciated WIL opportunities and can plan for future activities to address gaps in their competence. This process requires students' active engagement, mentoring and support from teaching staff (15), which has training and resourcing implications.

Competency-based portfolios assist students to identify further training areas, which the literature suggests is valuable (29). This approach encourages students to reflect across the course rather than within specific subjects/units only (29). PebblePad data, despite feedback recommending improvements, provides early insights into the impact of a personal learning space to document competency achievement. Future results may contribute to literature on e-portfolios and competency-mapping approaches (30).

Equipping students with global citizenship skills prepares them to address complex public health challenges (10). Findings indicate that students excel in the social responsibility dimension, but lag in the political voice category of the global civic engagement dimension. This suggests a need to address local, state, national and global community issues by promoting volunteerism, political activism and community participation (13). Comparing baseline findings with subsequent years after students have completed units with a stronger global civic engagement focus will yield deeper insights.

A study limitation is the small first-year cohort size and low survey response rate, and the potential

for student withdrawals before second- and third-year data are collected. There is also the potential for non-response bias due to the possibility that more motivated students responded to the survey request. A mixed-methods design may address this, offering a comprehensive understanding and robust data interpretation (33). A further limitation is the lack of validity and reliability testing on adapted instruments; however, all instruments were piloted with the cohort prior to use. Data triangulation, comparing scores across three timepoints using valid and reliable instruments (13,22,24), combined with qualitative data to explore student perspectives, will increase study reliability and validity (28).

Conclusion

Assessing a revised Health Promotion course and approach for assessing student achievement of the Competencies and Standards on first-year students' competence, global citizenship and professional identity provides direction for strengthening health promotion discipline knowledge and skills. Early positive findings will help address knowledge gaps in competency-based health promotion education, and future findings of the cohort study will be used to make recommendations for how the tertiary education sector can engage with industry to strengthen the health promotion workforce.

Acknowledgements

The authors gratefully acknowledge the students who participated in this research.

Declaration of conflicting interests

The authors have no conflicts of interest to declare.

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by Curtin University's Learning Innovation and Teaching Excellence Centre's 2022 iSoLT Small Grants Scheme.

Ethics

The Curtin University Human Research Ethics Committee approved the study (HRE2021-0169).

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Original Article

Filling gaps – a case study in building advocacy capacity in the health promotion workforce

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Abstract: Public health advocacy is a fundamental part of public health and health promotion practice. However, gaps exist in the provision of public health advocacy knowledge and skill acquisition both in the tertiary environment and within ongoing professional development programmes. The Goulburn Valley Public Health Unit partnered with the Public Health Advocacy Institute to build the skills of 49 public health and promotion professionals in their regions, to enable them to lead an advocacy project that aimed to promote state-wide initiatives. This involved a series of face-to-face skills-based public health advocacy workshops and post workshop e-mentoring. Results included the creation of locally relevant public health advocacy projects and a community of practice.

Keywords: advocacy (including media advocacy), health promotion, workforce development

Why is advocacy important to public health and health promotion?

Public health advocacy is a fundamental part of public health and health promotion practice (1). The World Health Organization (WHO) describes advocacy for health as a combination of individual and social actions designed to gain political commitment, policy support, social acceptance and systems support for a particular health goal or programme (2). It is included as one of three pillars within the WHO's Ottawa Charter for Health Promotion, being to advocate, enable and mediate (2). In 2016, the International Union for Health Promotion and Education (IUHPE) published a set of Core Competencies and Professional Standards, which underpin the registration and accreditation of health promotion professionals. The nine competencies specify the knowledge, skills and performance criteria required to demonstrate acquisition of the core competencies. One of the nine core competencies is the ability to advocate for health, requiring an applicant to competently advocate with, and on behalf of individuals, communities and organisations to improve health and wellbeing and build capacity for health promotion action (3). This competency is reflected in the broader public health sector contemporary expectation that a public health practitioner can advocate for healthy public policies and services that promote and protect the health and wellbeing of individuals and communities (4).

Advocacy is an important tool to build skills of the health promotion and public health workforce in order to strengthen health programmes, services and policies leading to improved health and societal outcomes (5). Yet, an audit of advocacy curricula in undergraduate and postgraduate Australian

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(This manuscript was submitted on 19 December 2023. Following blind peer review, it was accepted for publication on 24 March 2024).

Global Health Promotion 1757-9759; Vol 31(4): 37–43; 1246778 DOI: 10.1177/17577592412467778 journals.sagepub.com/home/ghp

university courses identified that one-third of all identified degrees do not include advocacy as part of core curricula, with advocacy rarely included in degree learning outcomes (6). Other studies have identified that once graduates enter the workforce there are limited professional development opportunities in advocacy, and a limited number of advocacy organisations exist to provide expert guidance (7,8).

Both health promotion and public health are ambitious health-related enterprises of the 20th century, with advocacy seen as a key strategy (9). However, there is a critical need to build the capacity of our current and future public health workforce in public health advocacy as it has been demonstrated that advocacy can achieve systemic change by addressing the social determinants of health (1,10).

These issues highlight the need for external courses to be offered to health promotion and public health professionals to address current curriculum gaps and ensure that the workforce is equipped to understand what advocacy is, how it can add value to existing programs and how best to evaluate its effectiveness.

To address this gap, the Public Health Advocacy Institute (PHAI) based at Curtin University developed and facilitated a series of skills-based advocacy workshops with the aim to increase skills and address the necessity of public health advocacy among health professions. These interactive, action-focused workshops added a new dimension to how public health and health promotion professionals are trained in advocacy, and aimed to strengthen the workforce and build healthier communities. The case study that follows outlines the process and impact within six months of the advocacy training being completed. This case study could be replicated in other regions or countries.

Impetus to change – the Goulburn Valley Public Health Unit

The Goulburn Valley Public Health Unit (GVPHU) is one of nine public health units across metropolitan and regional Victoria, representing seven local government areas across north-eastern Victoria. The unit governed by Goulburn Valley Health (GV Health) was originally established in late 2020 in response to the COVID-19 pandemic and is funded by the Victorian Department of Health. The vision of the GVPHU is to facilitate equitable, accessible health services and consistency of care through empowering people in the community to optimise their individual wellbeing and drive better health outcomes across the region. The GVPHU focuses on five key areas of work, being Health Protection, Intelligence Systems and Digital Innovation, Public Health Integrated Planning and Programs, Engagement, Communications and Capacity Development and Emergency Management (11). In 2023, in partnership with a community Health Service in North East Victoria, Gateway Health, the GVPHU embarked on an advocacy project that aimed to address the need for advocacy skills to assist in the systems changes needed to improve the community's health. There was also a systems perspective understanding of the complexities of the causes and consequences of health promotion issues among some of the staff owing to their involvement in group model building to address obesity (12). Within the project objectives were two key foci, including the building of capacity, skills and knowledge of advocacy within the health promotion and prevention sector, and the integration of advocacy into everyday work. The GVPHU and Gateway Health partnered with PHAI to achieve these two objectives.

Conceptual framework for the advocacy training

Advocacy is the active support of a cause and aims to develop consensus driven key messages, programmes and policies to promote the cause. Public health advocacy efforts can take on many forms, employing a range of strategies that aim to influence and advance evidence-based policymaking to improve health and wellbeing for individuals and populations. Whatever the form, public health advocacy requires a clear call to action and needs to be solutions based. A critical point of difference between advocacy and more generic public health strategies is the need to maximise support by strategically planning the ways the cause will be argued, including giving special attention to counteracting or reframing any strengths of potential opponents' arguments (1,13). Effectiveness of public health advocacy can be demonstrated in changes to tobacco control legislation in Australia, where advocates used strategies such as collaboration and promoting new evidence to achieve continued

government investment in no smoking campaigns and forming a chorus of health groups strongly urging the Government to place graphic images of smoking health outcomes on every pack of cigarettes sold in Australia. Advocacy strategies such as these were successful in securing public and political support for tobacco control legislation, policy and programme support.

Over the past few decades, several authors have described the processes of policy development and implementation in terms that are helpful for understanding public health policy and advocacy (14,15). Public health advocacy products, processes and participants are part of a multidimensional effort that has frequently defied diagrams and clear conceptualisation (16). To address this, the PHAI developed a conceptual framework for the process of public health advocacy that is consistent with advocacy theory and is based on a cyclical process. Within the model, there are eight stages and within each stage, there are multiple steps or components. Each stage is logically sequential, reflecting the fact that attention shifts conceptually – temporally and, over the short term, from one stage to another throughout the public health advocacy journey. The eight stages answer the following questions, and examples of how the questions are addressed and how this model is used, were discussed in the advocacy workshops.

1. What is the issue or 'advocacy ask'?: The advocacy ask needs to be stated clearly, describing what is hoped to be solved through policy change. During the workshops, participants were asked to identify local issues where policy change could increase health outcomes. These issues were noted, discussed and in some cases combined (e.g. obesity and junk food). A group consensus activity identified issues that workshop participants would address in small groups. Issues were then magnified, and each group identified a specific policy change that formed their advocacy ask.
2. What evidence is needed to advance advocacy and how robust is it? Time did not permit workshop participants to extensively seek all available and emerging evidence relating to their advocacy ask. Instead, discussions revolved around what evidence is, ensuring its credibility and how to present it to enable influence.
3. Who or what is the opposition? The workshop provided case studies on how advocacy issues will have allies and opponents. Identifying potential opposers to the advocacy ask, pre-empting the evidence the opposition may use, anticipating the type and degree of pushback and allocating resources to combat opposition were discussed. The workshop participants used this theory to identify potential opposition related to their advocacy ask.
4. Who are you seeking to influence? Advocacy is a form of influence, and clearly articulating who the policy ask is targeting in order to change policy is a critical step. At this stage, the workshop examined internal, external, political and media and community advocacy as key drivers for influence and participants identified who their advocacy ask was seeking to influence.
5. Who will be your coalition or partners? The workshop focused on the idiom of 'being inside the tent' and the power that can be generated from coalitions. Formal and informal coalitions, the benefits of partnerships and power were discussed, before participants identified potential partners for their advocacy ask.
6. What is your key message? At the end of the advocacy journey, what is the one question you want answered? In advocacy, there is an expectation that to be successful the coalition must 'sing from the same hymn sheet' to ensure a memorable and repeatable message and advocacy ask. Participants were given the opportunity to develop key messages relevant to their advocacy ask.
7. Which advocacy strategies are best suited to achieve your advocacy ask? An extensive array of advocacy strategies was showcased in the workshops and aligned with those in the Advocacy in Action Toolkit (1). Participants were given time to identify innovative advocacy strategies, which formed the basis of participant presentations at the completion of the workshop.
8. How will you measure how or if your advocacy programme has achieved the advocacy ask or policy change? The importance of, and challenges associated with, measuring change from advocacy were identified. A guide to evaluating advocacy efforts as outlined in the Advocacy in Action Toolkit (1) was provided and participants were asked to consider their evaluation tactics.

This model is shown in Figure 1.

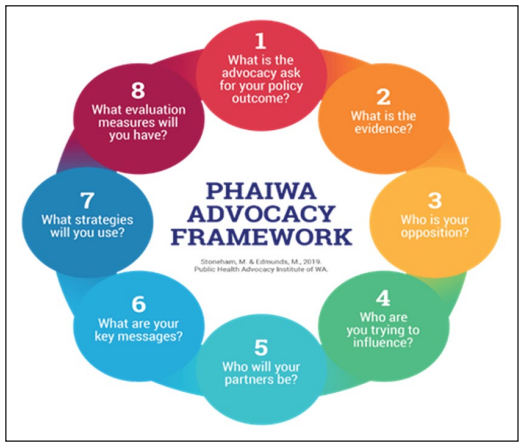

Figure 1. Public Health Advocacy Institute advocacy model.
PHAIWA: Public Health Advocacy Institute of Western Australia

The workshops utilised a constructivist or enquiry-based approach to learning, which enabled the participants to apply the theory taught to local community priorities, rather than on previously run state or national advocacy examples. The topics generated by the participants reflected local social and political issues within participant-led small group activities, and encouraged practical problem-solving rather than abstract or deductive thinking.

Background on the advocacy workshops

Across the Hume region, the health promotion workforce is engaged in RESPOND (17), a community-based systems dynamics approach to understanding the complexities of and addressing childhood obesity. In February 2023, Gateway Health received a request from the Wodonga RESPOND (brains-trust) community to provide advocacy training. Gateway Health and GVPHU formed an official partnership and agreement to develop and implement the advocacy project. This involved regular meetings and a preadvocacy survey to identify baseline knowledge and skills in advocacy. The survey targeted health prevention staff and Community Health–Health Promotion workforce in the Hume region to gain an understanding of the level of need and scope for the advocacy training.

To support the GVPHU in meeting their objectives, it was agreed to conduct three skills-based public health advocacy capacity-building courses in 2023; two in Benalla, Victoria and one in Wodonga, Victoria. Two of these workshops targeted health professionals, with the third targeting community members. The first health professional workshop was one day in duration and the second workshop ran over two days. The final one-day workshop catered to community members who were interested in pursuing advocacy goals. It was further agreed that PHAI would offer e-mentoring sessions for up to five campaign advocacy groups following the workshops. The e-mentoring was an opt-in activity, to enable workshop participants to actively use the knowledge, skills and partnerships developed at the workshops.

The advocacy model illustrated in Figure 1 was used as a framework for the course development. The model provided a mechanism for working through typical steps in advocacy strategy development, allowing for tailoring to meet local needs. The workshop facilitated a process where participants gained consensus on which local issues would be the focus of their advocacy plan for the workshop duration. In general, each workshop addressed four local issues. Sufficient time was allocated to ensure a solid theoretical understanding of each stage within the advocacy model, and was supported with the provision of examples of good practice followed by group work to develop local strategies for each stage. The workshops culminated with a presentation from each group acting out the advocacy plan to the whole group, with presentation styles embracing uniqueness and flair.

Participants and satisfaction levels

Over the three workshops, a total of 49 participants attended. The aim of these workshops was to facilitate discussion and build advocacy skills among different preventive actors in the Hume region in Victoria, with a view to develop a shared understanding of the current challenges and opportunities in this area. The three workshops were planned to integrate active learning, group participation, fun and relevant case studies while considering the diversity of contexts, needs and approaches. A workshop evaluation was completed by 34 participants (69%), with 56% attending the two-day workshop and 45% attending the one-day

workshop. The effectiveness data were similar across the one- and two-day workshops and indicated that the workshop aims were met. Of the respondents, all (100%) stated the workshop was excellent or very good and 16 (47%) participants advised that they would be interested in post-training mentoring. Every respondent (100%) indicated that having completed the workshop, they held more awareness about the development of an advocacy project or campaign, and 32 respondents (94%) advised that after having completed the workshop, they had the skills to develop an advocacy project or campaign as part of their role.

Encouraging sustainability – post workshop mentoring

Five advocacy campaigns emerged from the workshops. They identified local priorities and included:

- Addressing alcohol and gambling harm in Wodonga through policy (local government level);
- Mandating of Food and Drink Policy in school canteens – Victoria;
- Stakeholder engagement for both healthy eating and physical activity pillars of Community Health–Health Promotion plan;
- Increasing the visibility of the health promotion workforce through key messaging;
- Lobbying to gain political support for the Albury Wodonga Regional Food Share and Route 66 parklands trail.

The effectiveness of e-mentoring in the field of public health advocacy has been established, with studies identifying the value of such a programme to increase public health advocacy knowledge, skills, confidence and experience, and build public health networks (8,9). Studies also identified through participant feedback an increased confidence to integrate public health advocacy into their work practice and an awareness of the role of advocacy in the achievement of public health objectives (9). Given these findings and the ability for professional mentoring to stimulate the acquisition of theoretical knowledge, practical skills and encourage the application of the learnings (18) from the advocacy workshops, it was agreed that PHAI staff would e-mentor up to three people from each of the emerging advocacy projects developed during the workshops.

Over the six months post the advocacy workshops, a total of 11 professionals were involved in the e-mentoring programme, and nine unique e-mentoring sessions were conducted. Actions resulting from these sessions were diverse and included outcomes such as drafting alcohol policies, creating new networks and partners, encouraging submissions from community members and local professionals in response to a Community Impact Assessment for a packaged liquor outlet, creating consensus based advocacy campaign messages (#ThisIsPrevention; #HealthPromotionInMotion) and inspiring local community members to attend governance workshops with a view to running for local government elections.

The advocacy training also led into the development of a Hume advocacy Community of Practice (CoP), a collective of workshop participants who continue to meet following the advocacy workshops to progress advocacy ideas, provide support and build coalitions. The CoP has 24 members from 11 organisations and meets monthly. Overall, the advocacy training, the CoP and the mentoring programme increased engagement and partnerships with health promotion and prevention partners as well as the broader contribution to longer term capacity building in advocacy across the Region.

Discussion

This paper describes the capacity building of local public health and health promotion staff to integrate public health advocacy within their current project planning and implementation.

As advocacy is not currently or routinely included within the core curriculum of many universities, some public health students are graduating without advocacy competencies. This has a knock-on effect, resulting in certain sectors of public health being insufficiently prepared to develop and deliver advocacy. This can stall public health and health promotion advances that seek to build consensus, seek policy change, or improve the health of populations. It can also affect professionals seeking accreditation under the IUHPE core competencies programme. It was observed that independent courses such as those that PHAI offers are critically

needed to fill this gap and provide practical strategies to build the workforce capacity in advocacy. Building local capacity likely creates positive change within communities (12), and this project shows that providing capacity building in public health advocacy through skills-based workshops and e-mentoring can support the public health workforce to access and apply knowledge from PHAI's experience in complex advocacy and community-based health promotion projects.

The absence of an advocacy model on which to base capacity building and planning of advocacy programs was identified. There has not been a widely used or accepted framework or model for describing and explaining how public health advocacy can add value to existing programmes. The PHAI framework, coupled with numerous relevant practice examples used to guide the advocacy training, filled this void and can support public health professionals to build advocacy capacity, ensuring their programmes, partnerships, policies and services are as effective as possible.

The advocacy workshops and post workshop mentoring provided a critical resource to build knowledge, skills and confidence for workshop participants to proactively engage in advocacy activities. The e-mentoring programme was effective in supporting participants to navigate advocacy in the real world. The mentoring relationships were clear regarding aims and expectations, had the support of senior managers and, because all participants knew the mentors and had established a rapport at the face-to-face workshops, there was a good 'fit' between the underlying ethos of health promotion, public health, advocacy and the model of mentoring. The diversity of actions resulting from the e-mentoring programme demonstrates the effectiveness of this approach.

The public health advocacy capacity building model represents one of the first sustained efforts to integrate advocacy capacity within the Hume region public health and health promotion workforce. The capacity building provided the opportunity for the GVPHU staff to work with local partners to support and plan informed and collaborative advocacy projects that aimed to enhance the health and wellbeing of their local communities. This was demonstrated by their ability to collectively identify and plan advocacy programmes focused on local priorities and the formation of the local community of practice. This programme of delivering tailored advocacy workshops in local communities, with follow-up e-mentoring to support emerging advocacy programmes which built upon the knowledge and skills developed at the workshops, serves as a model for ensuring advocacy is a core topic of professional development programmes. It also safeguards high quality, innovative and effective advocacy programmes and leadership that continue to advance the public health workforce.

Conclusion

This paper has provided an example of establishing the capacity of public health advocacy within a regional Victorian public health workforce, and could be replicated in any region or country.

Despite advocacy being a core pillar and competency within the public health fields, public health advocacy is not well addressed in either university curricula or within ongoing professional development programmes, resulting in certain sectors of public health being insufficiently prepared to develop and deliver advocacy. This case study demonstrates that many public health professionals are interested to learn how to integrate advocacy into their mainstream duties and, when offered the opportunity, are enabled to forge local partnerships, coalitions and projects to progress locally relevant advocacy.

Providing staff development opportunities in public health advocacy can inspire partnerships within and across sectors to address complex public health issues.

Declaration of conflicting interests

The authors have no conflicts of interest to declare.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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Original Article

Environmental measures to improve pedestrian safety in low- and middle-income countries: a scoping review

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Abstract:

Objectives: This scoping study aims to identify environmental road safety measures implemented in low- and middle-income countries (LMICs) to reduce pedestrian injuries from collisions with motor vehicles.

Methods: This review followed Arksey and O'Malley's approach and reported results using the PRISMA-SCR 2018 checklist. A literature review was conducted in Medline, Google Scholar, and the Transport Research International Documentation database using keyword-derived medical subject heading terms. A total of 14 articles met the pre-established inclusion criteria and were analyzed using a data extraction matrix. The findings were categorized methodically into three prominent themes: (1) methods for reducing pedestrian exposure, (2) traffic calming strategies, and (3) measures for enhancing pedestrian visibility.

Results: Traffic calming strategies, including vehicular speed reduction, roadway contraction, and vertical and horizontal diversionary tactics, emerged as the most effective interventions for reducing pedestrian injuries within LMICs. Conversely, interventions geared towards minimizing pedestrian exposure, such as zebra crossings, crosswalks controlled by traffic signals, underpasses, or overpasses, often produced minimal effects, and occasionally exacerbated the risk of pedestrian accidents. Lack of pedestrian visibility due to density of street vendors and parked vehicles was associated with a higher risk of injuries, while billboards impaired drivers' attention and increased the likelihood of collisions with pedestrians.

Discussion: In LMICs, the effectiveness of environmental measures in reducing vehicle–pedestrian crashes varies widely. In the face of resource constraints, implementing interventions for pedestrian safety in LMICs necessitates careful prioritization and consideration of the local context.

Keywords: vehicle–pedestrian accidents, road injuries, road crashes, low- and middle-income countries, pedestrian victims

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(This manuscript was submitted on 12 October 2023. Following blind peer review, it was accepted for publication on 5 March 2024).

Global Health Promotion 1757-9759; Vol 31(4): 44–55; 1241513 DOI: 10.1177/17579759241241513 journals.sagepub.com/home/ghp

Introduction

The number of deaths from road accidents was estimated at 1.19 million in 2021, which corresponds to a rate of 15 per 100,000 habitants (1). Road traffic injuries were the 12th leading cause of death for all ages and the first leading cause of death worldwide for people aged 5–29 years. The mortality rate relative to the world's population has been decreasing steadily since 2010, when it reached a peak of 18 per 100,000 population. Considering that the number of motor vehicles on the road increased by 160% over that period, the reduction in death per 100,000 vehicles, i.e., from 79 to 41, becomes even more important.

These figures are averages that mask inequalities in progress from one region and country to another. There is a disparity between high-income countries (HICs) and low- and middle-income countries (LMICs). Overall, it appears that the risk of death is linked to a country's income level, with a mortality rate nearly three times higher in low-income countries than in HICs, with 21 versus 8 deaths per 100,000 inhabitants, respectively (1). An astonishing 92% of road accidents worldwide occur in LMICs, even though they account for only 72% of motor vehicles globally. Given these conditions, the World Health Organization (WHO) warns that Target 3.6 of its Sustainable Development Goals (i.e., reducing by half the number of deaths and injuries worldwide due to road accidents) may be missed by 2030, and calls for a 'paradigm shift in leadership, commitment, investment and action (1,2).'

Pedestrians are among the most vulnerable road users, accounting for 23% of road deaths (1,2). This proportion is even higher in LMICs, reaching 27% in Africa. There are several reasons for the excess risk to pedestrians in LMICs: the rapid growth of urbanization and motorization; the mix of traffic involving trucks, cars, cyclists and pedestrians; and, above all, the lack of separation between different road users, which disproportionately increases pedestrian risk, exacerbating existing health inequities (3,4). Roads are generally built to satisfy the needs of motorists foremost, neglecting the needs of pedestrians, whose lack of physical protection makes them much more vulnerable to injury in road accidents. Pedestrians also tend to comprise children and the elderly, whose cognitive and psychomotor development and physical abilities, respectively, further add to their risk of injury (5,6).

Vehicle–pedestrian injuries (VPI) include all events where at least one pedestrian is injured by a motor vehicle in motion. In addition to their effects on public health, road accidents hamper the development of LMICs: they lead to work and school interruptions, loss of productivity, and very high health and socioeconomic costs for victims, families, and countries. A 2017 study showed that a 50% reduction in road accident injuries and deaths could generate an additional income stream of 7–22% of GDP in some LMICs (7).

Despite this burden, it remains unclear which policies and interventions are effective in reducing VPIs in LMICs. Some literature reviews have explored this topic, but were either limited to HICs or were not focused on pedestrian victims (8–11), and there are several urgent reasons to review literature specifically focused on VPIs in LMICs. Firstly, the contexts differ greatly between HICs and LMICs, and, arguably, even between LMICs. While income level is associated with stratification of the burden between countries, it is reasonable to assume that the effectiveness of interventions may also vary according to countries' wealth levels or other sociocultural characteristics (11). Secondly, while many different policies can reduce road accidents, their effectiveness in reducing morbidity and mortality varies by the type of user. This review focuses strictly on interventions to reduce the risk of pedestrians – the most vulnerable of road users. In the same vein, it was decided to limit the literature review to studies that examined environmental measures to reduce VPIs, i.e., those interventions that act on the built environment and are described as 'passive' because they require no effort or participation on the part of the individual being protected (12). By adopting a systemic approach, environmental measures are highly successful since they bring about lasting changes that act on all individuals, whatever their age, sex, state of health, literacy, behavior, or socioeconomic level (13,14). Finally, these measures contribute to reducing health inequities, which is of particular interest for LMICs (12,15).

This scoping review aims to understand the nature and extent of the understudied phenomenon of VPIs and the environmental interventions implemented in LMICs to reduce them. By filling this important

gap, we hope to help inform national authorities of the best strategies for improving pedestrian road safety.

Methods

Search strategy

The review followed the approach advocated by Arksey and O'Malley (16) for conducting scoping reviews, which comprises five steps: (1) formulation of the research question; (2) identification of relevant studies; (3) selection of studies according to inclusion and exclusion criteria; (4) extraction and mapping of data categorized according to key findings; and (5) reporting of results. The PRISMASCR checklist (Preferred Reporting Items for Systematic Reviews and Meta-Analysis Extension for Scoping Reviews) was used to report, filter, and communicate our results (Appendix) (17). The protocol was not published.

The first step consisted of identifying the three key concepts that guided this literature search: 'road accidents,' 'pedestrians,' and 'environmental measures' (see Appendix 1). A limited search was performed in Google Scholar to identify additional terms and synonyms used in the literature to refer to these concepts. The complete list was discussed among the authors to seek additional suggestions, and derived MESH (Medical Subject Heading) terms were identified.

In the second step, all identified keywords and MESH terms were searched in three databases: Medline, Google Scholar, and the Transport Research International Documentation database. There was no time limit (the search was conducted in March 2022). Boolean operators (*and*, *or*) combined the keywords and their synonyms, and the truncation sign * was used at the end of the keywords when appropriate. The following search equation was generated:

((((road* *or* highway* *or* traffic) *and* (safety *or* security *or* accident* *or* injury* *or* crash* *or* collision*)) *and* pedestrian*) *or* (pedestrian-vehicle collision* *or* pedestrian-vehicle accident* *or* pedestrian-vehicle crash* *or* vehicle-pedestrian collision* *or* vehicle-pedestrian accident* *or* vehicle-pedestrian crash*)) *and* (urban* *or* town* *or* city *or* cities *or* built environment *or* city planning *or* road* *or* pedestrian* crossing* *or* street*)

This search equation was replicated across the three search engines. Although the search terms were all in English, publications in French were also considered.

Inclusion/exclusion criteria

All types of studies were considered in this review, regardless of methodology (quantitative, qualitative, mixed), design (experimental, descriptive, etc.), or format (peer-reviewed article, scientific presentation, case study, research report, etc.). All references were exported to Zotero, where duplicates were removed. Titles and abstracts were screened systematically, and any record that did not mention one or several LMIC(s) was removed (see Appendix 2). In a second stage, the articles were read entirely and two other exclusion criteria were applied: written in a language other than French or English; and not presenting original, empirical results. Lastly, only studies that focused on VPIs and environmental measures were retained for the review. The screening process was performed independently by two researchers; in case of a disagreement, a third researcher read the article in full and decided whether to include it or not. A PRISMA flow chart summarizes the number of records at each step of the screening process (Figure 1).

Data extraction and analysis

Since this was a scoping review, the quality of the included studies was not estimated based on a grading scale, as recommended elsewhere (18). Summary data were extracted using a matrix that specified the first author's name, the country of study, the study design, the intervention under study, and the study's main results. A descriptive qualitative analysis was carried out to examine and organize the results according to a thematic framework developed by the WHO (19) that has identified four main categories of environmental interventions to reduce VPIs: (1) traffic calming measures, which include interventions that reduce speed of motorists; (2) measures to reduce pedestrian exposure to

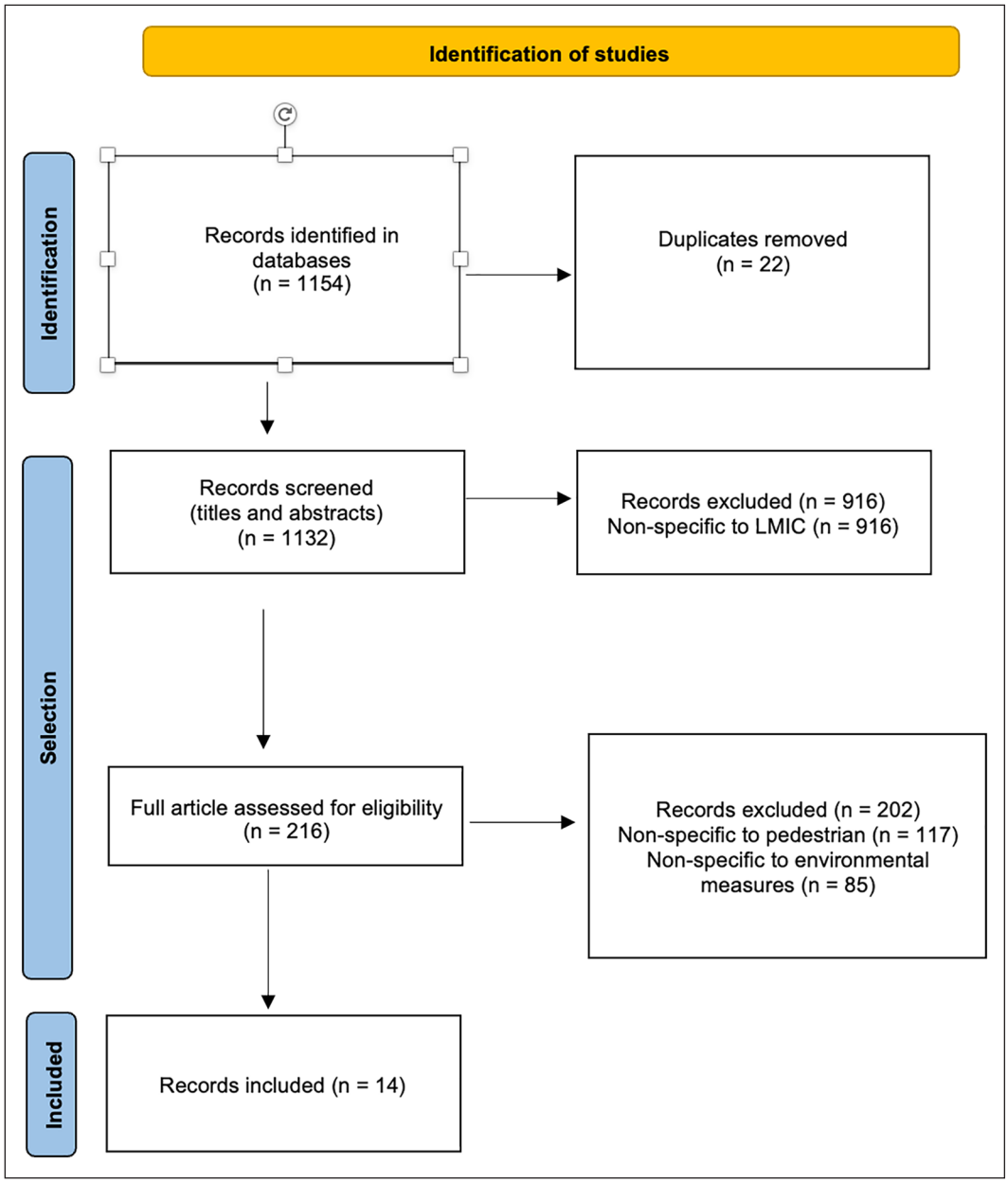

Figure 1. PRISMA flowchart for identification and selection of articles. LMIC, low- and middle-income countries.

vehicular traffic, including road improvements to better separate the different categories of road users or to reduce traffic volume; (3) measures to improve visibility for both pedestrians and motorists; and (4) improvements to vehicle design to maximize pedestrian protection, notably by promoting pedestrian safety assessments and other technical regulations or features.

Results

After consulting the three databases, 1154 articles were identified, of which 22 duplicates were identified and removed. Of these records, 14 articles dealing with environmental measures implemented in LMICs to reduce VPI risk were retained for the synthesis (Figure 1).

Among the 14 studies, 5 were carried out in Africa (South Africa and Ghana), 4 in Asia (India, Malaysia and Pakistan), and 5 in Latin America (Peru and Colombia). Most studies (12/14) used quantitative data only; the remaining 2 were mixed methods studies. Study designs included pre–post intervention, interrupted time series, case-control, and case study, but no randomized controlled trials met the inclusion criteria. All studies were carried out between 2003–2022 and focused on one of the environmental interventions identified by the WHO, although no study specifically considered improvements in vehicle design (Table 1). A visual representation of the main road features or interventions considered in the 14 studies is provided in Appendix 3.

Traffic calming measures

Three different groups of interventions were found in this category: traffic speed reduction measures or speed limits (20–22), vertical deviations, and horizontal deviations (20,23,24). Vertical deviations, like speed bumps, speed cushions, and raised intersections, are rounded, raised features that slow down traffic. Horizontal deviations are typically curb-line arrangements (i.e., chicanes, which require vehicles to follow an S-shaped path) on either side of a two-lane road, road narrowing, or central islands. These measures create a safer and more controlled driving environment, particularly when they are employed together.

Reducing the speed of motor vehicles using environmental measures has great potential to reduce VPIs. In Ghana, the average speed of vehicles and the proportion of motorists exceeding 32 miles per hour (mph) were both statistically lower in areas with traffic calming measures than in control areas, and the risk of VPI was significantly higher in areas without traffic calming measures (odds ratio (OR) = 1.98) (20). In New Delhi, comparing four studies on the impact of speed on pedestrian safety, one study concluded that even small reductions in average speed significantly reduced pedestrian fatalities; a 1% reduction in average speed corresponded to a 7% reduction in pedestrian fatalities (22). The Peruvian study came to similar conclusions: high traffic volumes and high vehicle speeds were associated with a nearly eightfold increase (OR = 7.88) in the risk of mortality and a fivefold (OR = 5.35) increase in the risk of collisions involving child pedestrians (21).

In Colombia, the number of lanes was positively associated with pedestrian casualties ($\beta = 0.982$) suggesting that road diet (i.e., reducing the number of travel lanes and/or effective width of the road) can improve pedestrian safety and reduce VPIs (25).

Installing speed humps and extended speed bumps on road sections in two South African districts reduced the number of VPIs in the two areas by 23% (23). The median annual rate of severe collisions between pedestrians and vehicles per kilometer of road also decreased from 1.41 to 0.96 ($p = 0.007$) and from 2.35 to 1.40 ($p < 0.001$) in the two zones respectively (23). In Ghana, VPI severity was significantly lower in the presence of traffic calming measures such as speed humps and extended speed bumps. After adjustment for gender, age, and time of day, the risk of pedestrian death was higher (OR = 1.78) for road sections that did not implement traffic calming measures compared with sections that did (20). In towns where traffic calming plans include speed humps, fatal accidents for pedestrians were three times lower. Horizontal detour measures, such as barricades and chicanes, reduce drivers' field of vision, forcing them to reduce speed and be more attentive to their surroundings. These have been successful in Peru, where VPIs were less frequent in the presence of a chicane or barricade (OR = 0.11) (24).

Reducing pedestrian exposure

Many LMICs lack pedestrian-specific infrastructure (sidewalks, footpaths), meaning that roads are shared between pedestrians and other road users. As a result, pedestrians are more exposed to the risk of collision than in HICs (26). The literature has identified several road improvements that reduce pedestrians' exposure to the risk of collisions with vehicles, such as sidewalks, delineations separating pedestrians from road users, zebra crossings, crosswalks controlled by traffic lights, central medians and refuge islands, footbridges, and underpasses (21,25–31).

Table 1. Description of the studies included in the review.

Authors (Year)	*City, country*	*Type of study*	*Intervention/ feature under study*	*Main results and effectiveness of interventions*
Afukaar (2003)	Accra and Kumasi, Ghana	Pre–post intervention study	Rumble strip	Installing rumble strips on the main Accra-Kumasi freeway reduced accident CIPs and fatalities
Ahmed *et al.* (2021)	Putrajaya, Malaysia	Descriptive mixed methods study	Zebra crossing	(1) The zebra crossing was the most important to ensure pedestrian safety (2) The four interventions with the most significant impact were: speed limits, crosswalk provisions (time, width, and length of crosswalk), road signs and pedestrian traffic lights
Aidoo *et al.* (2013)	Accra, Ghana	Risk factor analysis Cross-sectional study	Street lightning Speed bumps	(1) In a pedestrian collision, hit-and-run accidents are favored by poor road lighting and weather conditions, poor road conditions, lack of a central median, etc. (2) The use of median separations, speed bumps and the installation of public lighting in road design and construction helps to reduce the risk of VPI and hit-and-run
Cantillo *et al.* (2015)	Bogota, Colombia	Risk factor analysis Cross-sectional study	Footbridges Crosswalks controlled by traffic lights	(1) Pedestrians' decision to cross a road, to use a footbridge or a signalized intersection is influenced by variables such as the safety/security and attractiveness of each alternative (2) These variables are, in turn, strongly determined by the individual's socioeconomic characteristics and conditioned by the circumstances of the journey (3) Distance to pedestrian bridges or signalized crosswalks is associated with dangerous crossings
Damsere-Derry *et al.* (2019)	Accra, Ghana	Matched case-control study	Speed control Speed cushions Speed bumps	(1) Average vehicle speeds, the proportion of vehicles exceeding the 50 km/h speed limit, and pedestrian fatalities were significantly lower in towns with traffic calming measures (2) Traffic calming devices, including Berliner cousins, were effective in reducing accidents
Donroe *et al.* (2008)	Lima, Peru	Case-control study	Speed control Curb between pedestrians and others	(1) High traffic volumes and high vehicle speeds are associated with the number of fatalities (2) The risk of collisions involving child pedestrians was increased by a high volume of vehicles, lack of lane demarcation, high vehicle speeds and a high density of street vendors
Khatoon *et al.* (2013)	New Delhi, India	Pre–post intervention study	Grade separator Underpass	(1) Dangerous crossings remain at intersections despite the existence of underpasses (2) Removing pedestrian traffic lights due to the underpass has increased speed variability
Nadesan-Reddy and Knight (2013)	Durban, South Africa	Time-series study	(Extended) speed bumps	Speed bumps are associated with a drop in pedestrian-vehicle severe collisions and fatal pedestrian collisions

(Continued)

Table 1. (Continued)

Authors (Year)	*City, country*	*Type of study*	*Intervention/ feature under study*	*Main results and effectiveness of interventions*
Quistberg *et al.* (2014)	Lima, Peru	Case-control study	Crosswalks controlled by traffic lights	(1) Collisions were more frequent in the presence of pedestrian signals (2) Longer duration of the pedestrian signal was associated with a higher risk of collision (3) Signals were associated with an increased risk of pedestrian-vehicle collision (4) The presence of a police officer was associated with a reduction in pedestrian collisions
Quistberg *et al.* (2015)	Lima, Peru	Case-control study	Sidewalk Curb between pedestrians and others Chicanes/ Barricade	(1) VPIs were less likely in the presence of a curb and sidewalk on both sides of the road and a pedestrian barricade (2) The risk of collision was higher in the presence of street vendors and of parked vehicles 3) VPIs were less frequent in the presence of a chicane or barricade
Goel (2021)	New Delhi, India	Meta-analysis of four cross-sectional studies	Speed reduction	(1) Small reductions in average speed translate into significant reductions in pedestrian fatalities
Umair *et al.* (2022)	Punjab, Pakistan	Risk factor and spatial analysis Cross-sectional study	Green belts and central open areas/islands Narrowing/raised medians Billboards at crossroads	(1) Central areas reduce the number of VPIs, as pedestrians cross the road more safely in two stages (2) Billboards at crossroads increase the occurrence of accidents and distract the drivers (3) Billboards and buildings over three storeys reduce motorists and pedestrians' visibility
Vergel-Tovar *et al.* (2020)	Bogota, Colombia	Risk factor analysis Cross-sectional study	Footbridges Road narrowing/ diet	(1) The presence of pedestrian bridges is positively associated with the number of road accidents for all road users (2) Lane width, number of lanes, longer crossing distances for pedestrians, and speeding are positively associated with a high probability of VPI (3) Density and distance to intersections are correlated with road safety
Sinclair and Zuidgeest (2015)	Cape Town, South Africa	Descriptive Cross-sectional study	Footbridges	(1) Pedestrians cross where it suits them best, not necessarily where it's safest or where there are crosswalks (2) The perception of danger and crime-related activities in/around footbridges influence pedestrian's decisions to use them, alongside common factors such as convenience, time savings, and perceived traffic risks (3) Jaywalking and crossings on the street occur near bridges

CIP, casualty incident profiles; VPI, vehicle–pedestrian injuries.

In Peru, a study showed that VPIs were less likely (OR = 0.19) in the presence of a curb and sidewalk on both sides of the road than in their absence (24). In addition, sidewalks with curbs or barricades were associated with significantly fewer VPI than sidewalks without them. Similarly, the absence of lane demarcations between pedestrians and other road users was associated with a sevenfold increase in the risk of collisions involving child pedestrians (OR = 6.59) (21). In Malaysia, zebra crossings were one of the most effective interventions to improve pedestrian safety, although their effectiveness was conditional on the time required for pedestrians to cross and the length and width of the zebra crossing (32). In Pakistan, medians and refuge islands were associated with a significant reduction in the number of VPIs ($\beta = -116{,}291$; $p = 0.038$), since they allow pedestrians to cross the road in two stages with a safe space in between (31). In Peru, the presence of a police officer at intersections to regulate traffic considerably reduced the risk of collisions between motor vehicles and pedestrians compared with unsupervised sites (OR = 0.05) (31).

In contrast, some interventions increased rather than decreased the risk of VPIs. Notably, traffic lights at crossroads increased the risk of VPI in Peru (OR = 8.88). Crossing during the pedestrian green signal was associated with a fivefold increase in collision risk for each 15-s increase in crossing time (OR = 5.31) (30). Footbridges and underpasses also showed mixed results, since pedestrians' decision whether or not to cross a road dangerously does not always depend on the presence of footbridges or underpasses, especially when they do not meet pedestrians' mobility needs (26). Many other factors, such as the convenience of underpasses and tunnels, their safety, time savings, and the perception of traffic-related risks, affect pedestrians' willingness to use them (25,28). The proximity of a pedestrian bridge was positively associated with the frequency and lethality of all-type road crashes, although it is unclear whether pedestrians were more at risk or not (25).

Installing rumble strips (road safety features that cause vibration and audible rumbling for motorists) to separate motor vehicles from pedestrians helped limit traffic speed and ultimately reduced the incidence of VPIs by 51% (33).

Improving pedestrian visibility

A major contributing factor to collisions and fatalities is poor lighting or visibility between pedestrians and other road users. Several studies included in our analysis have described factors affecting pedestrian visibility, how visibility influences safety, and what interventions can be implemented to improve it.

Two studies have suggested that high number and density of street vendors blocking roadways was associated with an increased risk of VPIs (ORs 1.25–2.82 (21,24)), which persisted even when controlling for pedestrian volume. Their location (mostly at street corners) exacerbated the risk since it interfered with visibility of cross-traffic. Reduced visibility because of street vendors was presented as a contributing factor to VPIs, distinct from higher density of pedestrians on the streets. The presence of poorly or illegally parked vehicles was also found to increase the risk of VPI by approximately four times (OR = 3.67) (24). Billboards, which attract road users' attention and reduce pedestrian visibility, were also associated with a statistically significant increase in VPIs when located near junctions or intersections ($\beta = 174.6771$, $p = 0.000$) (31).

Discussion

Our scoping review aimed to synthesize evidence on the effectiveness of environmental measures to mitigate the incidence of VPIs in LMICs. While several reviews have examined this topic in HICs, our scoping review found scant data for LMICs. This is especially problematic considering that available evidence indicates that some interventions and features can have heterogeneous effects depending on the context.

This review confirms that traffic calming interventions improve pedestrian safety. This is aligned with previous results from HICs indicating that, for example, the creation of 20 mph traffic zones was effective in reducing motorist speed and improving pedestrian safety (15,34–36). Speed management is not simply a matter of posting regulation signage. Existing speed limits are often disregarded, particularly when authorities have limited capacity to enforce them (19). Our review reveals that to effectively reduce motor vehicle speed, physical and environmental measures must

be implemented, such as road narrowing, deviations, speed bumps, or cushions. This is in line with previous evidence gathered in HICs showing that these road features increase drivers' anticipation of potential threats, enhance their attention and cognitive load, and ultimately lead them to reduce their speed (37–42). Despite their popularity as traffic intervention measures, no studies meeting our inclusion criteria examined the effectiveness of roundabouts to reduce VPI; the effects of these installations on pedestrian safety continue to be a source of debate in HICs (43,44).

There was a paucity of studies on VPIs in rural areas. This may simply reflect the higher incidence of VPIs in cities (45); however, highways between major cities of many LMICs are shared by pedestrians, cyclists, and motor vehicles and give rise to collisions that involve pedestrians. The proportion of fatal injuries shared by pedestrians and motorcycles on rural highways is significantly higher in LMICs than in HICs (36). Lethality for pedestrian victims is 2.3 times higher in rural than urban areas, likely due to higher vehicle speed, inferior road safety infrastructure, and limited access to emergency healthcare (36,46).

Of all the interventions identified in this review, only those designed to reduce pedestrian exposure appear to have mixed effectiveness in LMICs. Traffic lights at pedestrian crossings, footbridges, and underpasses were associated with an increased risk of VPI, in contrast to their protective effect in HICs (47–50). Several hypotheses can explain these conflicting results. When installed at inappropriate crossings (high-speed or multi-lane roads, locations with poor sight distance, and poor compliance with traffic rules), traffic lights can falsely inflate pedestrians' sense of safety, decrease their vigilance, and even increase their impatience, any of which can ultimately result in increased risk of VPIs (19). Individuals with limited access or with inability, such as wheelchair users or elderly people, may be at even higher risk. Similarly, underpasses and footbridges can increase the distance and effort required to cross a road, which limits their use (26,28). These places are often characterized by (or perceived to be associated with) a high incidence of crime, discouraging their use and nullifying their potential benefits.

Several psychological mechanisms can help clarify this behavior among pedestrians. Waiting time at a signal-controlled crossing is likely to impact the attitude of pedestrians waiting to cross: the longer they have to wait, the greater the risk of crossing on red. Evidence suggests that after a waiting time of 40 s, pedestrians are more inclined to feel impatient and to cross at a red light (35). This impatience can be tempered by systems that discourage pedestrians to cross, such as countdown timers that provide the remaining waiting time for pedestrians at intersections (35). Using the health belief model (i.e., the notion that an individual's beliefs influence health-related actions or behaviors), a study revealed that pedestrians were more likely to disregard signals at crossings when (1) they did not perceive any danger of collision, (2) they perceived fewer losses than gains, or (3) they did not have a strong sense of obligation to obey (51). In the same vein, a recent meta-analysis suggests that pedestrians' decision to cross (or not) was associated mainly with vehicle speed, gap size, and frequency of attempts (52). Their results are in line with those of the present study, and support the recommendations for traffic calming interventions and, to some extent, refuge islands or other midblock street crossings.

While the objective of the present scoping review was focused on pedestrian safety and the effectiveness of interventions, financial considerations cannot be ignored, particularly in contexts with limited resources. Unfortunately, none of the included studies has addressed these aspects. A recent systematic cost–benefit analysis of road safety measures suggests that this ratio can vary significantly between interventions (53). Although the latter analysis was focused on all road users' safety (not only pedestrians), its results have highlighted that some interventions included in this study were amongst the most cost-effective, namely traffic calming measures (speed humps) or rumble strips.

This scoping review is subject to some limitations. First, its scope was deliberately restricted to studies that examined passive, environmental interventions to reduce VPIs in LMICs. While there are 'active' interventions, such as road safety education for motorists and pedestrians, previous systematic reviews have found no evidence of their efficacy (in randomized controlled trials) to reduce injuries (54). This has led some experts to call for a shift in focus from cognitive behavioral to environmental interventions in promoting road safety (55), but active and passive

interventions cannot always be clearly separated; for example, we discovered that a passive feature (traffic lights at crossings) can produce different effects depending on the level of compliance from road users. Although interactions between different measures are likely, the evidence is very limited – only one of the studies considered in this review evaluated the effects of a combination of several interventions. Finally, this review did not take into consideration other types of vulnerable road users, such as cyclists and motorcyclists, despite the grievous and growing mortality burden among them (40,000 and 380,000 deaths annually, respectively) (56).

Conclusion

Our scoping review highlighted the effectiveness of some environmental interventions to reduce the risk of VPI in LMICs. Our results reveal that traffic calming measures and road improvements to increase visibility, notably at crossings, are promising strategies to reduce pedestrian injuries. Physical road features like barriers or pylons that separate pedestrians from other road users have also been tested successfully. Improving safety at crossings remains a challenge, since some interventions can be counterproductive by creating a false feeling of security or by increasing impatience.

Our scoping review highlights the importance of conducting in-depth studies reviewing the effectiveness of interventions to improve pedestrian safety in LMICs, to ensure that the interventions adopted are effective and sustainable. This requires a holistic approach involving key stakeholders such as local authorities, urban planners, road designers and local communities to design interventions tailored to local context. Environmental measures must also take into account the specific needs of pedestrians with physical limitations, such as children, the elderly, and other individuals with limited mobility, hearing, and vision.

Acknowledgements

The authors acknowledge support from the Réseau Francophone International pour la Promotion de la Santé, the Institut National de Santé Publique, the Ministère des Relations Internationales et de la Francophonie du Québec, and the library services at University of Montreal. We thank Mrs. Loula Burton for proofreading the manuscript.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: this scoping review received funding from the Réseau Francophone International pour la Promotion de la Santé. TD is a FRQS J1 Research Scholar. The funding agency had no role in the design of the study; the collection, analysis, and interpretation of data; in the writing of the draft; or in the decision to submit the manuscript.

Ethics approval and consent to participate

Approval from a research ethics committee was not required to conduct this systematic scoping review. There was no participant.

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Supplemental material

Supplemental material for this article is available online.

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Original Article

Environmental measures to improve pedestrian safety in low- and middle-income countries: a scoping review

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Abstract:

Objectives: This scoping study aims to identify environmental road safety measures implemented in low- and middle-income countries (LMICs) to reduce pedestrian injuries from collisions with motor vehicles.

Methods: This review followed Arksey and O'Malley's approach and reported results using the PRISMA-SCR 2018 checklist. A literature review was conducted in Medline, Google Scholar, and the Transport Research International Documentation database using keyword-derived medical subject heading terms. A total of 14 articles met the pre-established inclusion criteria and were analyzed using a data extraction matrix. The findings were categorized methodically into three prominent themes: (1) methods for reducing pedestrian exposure, (2) traffic calming strategies, and (3) measures for enhancing pedestrian visibility.

Results: Traffic calming strategies, including vehicular speed reduction, roadway contraction, and vertical and horizontal diversionary tactics, emerged as the most effective interventions for reducing pedestrian injuries within LMICs. Conversely, interventions geared towards minimizing pedestrian exposure, such as zebra crossings, crosswalks controlled by traffic signals, underpasses, or overpasses, often produced minimal effects, and occasionally exacerbated the risk of pedestrian accidents. Lack of pedestrian visibility due to density of street vendors and parked vehicles was associated with a higher risk of injuries, while billboards impaired drivers' attention and increased the likelihood of collisions with pedestrians.

Discussion: In LMICs, the effectiveness of environmental measures in reducing vehicle–pedestrian crashes varies widely. In the face of resource constraints, implementing interventions for pedestrian safety in LMICs necessitates careful prioritization and consideration of the local context.

Keywords: vehicle–pedestrian accidents, road injuries, road crashes, low- and middle-income countries, pedestrian victims

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(This manuscript was submitted on 12 October 2023. Following blind peer review, it was accepted for publication on 5 March 2024).

Global Health Promotion 1757-9759; Vol 31(4): 44–55; 1241513 DOI: 10.1177/17579759241241513 journals.sagepub.com/home/ghp

Introduction

The number of deaths from road accidents was estimated at 1.19 million in 2021, which corresponds to a rate of 15 per 100,000 habitants (1). Road traffic injuries were the 12th leading cause of death for all ages and the first leading cause of death worldwide for people aged 5–29 years. The mortality rate relative to the world's population has been decreasing steadily since 2010, when it reached a peak of 18 per 100,000 population. Considering that the number of motor vehicles on the road increased by 160% over that period, the reduction in death per 100,000 vehicles, i.e., from 79 to 41, becomes even more important.

These figures are averages that mask inequalities in progress from one region and country to another. There is a disparity between high-income countries (HICs) and low- and middle-income countries (LMICs). Overall, it appears that the risk of death is linked to a country's income level, with a mortality rate nearly three times higher in low-income countries than in HICs, with 21 versus 8 deaths per 100,000 inhabitants, respectively (1). An astonishing 92% of road accidents worldwide occur in LMICs, even though they account for only 72% of motor vehicles globally. Given these conditions, the World Health Organization (WHO) warns that Target 3.6 of its Sustainable Development Goals (i.e., reducing by half the number of deaths and injuries worldwide due to road accidents) may be missed by 2030, and calls for a 'paradigm shift in leadership, commitment, investment and action (1,2).'

Pedestrians are among the most vulnerable road users, accounting for 23% of road deaths (1,2). This proportion is even higher in LMICs, reaching 27% in Africa. There are several reasons for the excess risk to pedestrians in LMICs: the rapid growth of urbanization and motorization; the mix of traffic involving trucks, cars, cyclists and pedestrians; and, above all, the lack of separation between different road users, which disproportionately increases pedestrian risk, exacerbating existing health inequities (3,4). Roads are generally built to satisfy the needs of motorists foremost, neglecting the needs of pedestrians, whose lack of physical protection makes them much more vulnerable to injury in road accidents. Pedestrians also tend to comprise children and the elderly, whose cognitive and psychomotor development and physical abilities, respectively, further add to their risk of injury (5,6).

Vehicle–pedestrian injuries (VPI) include all events where at least one pedestrian is injured by a motor vehicle in motion. In addition to their effects on public health, road accidents hamper the development of LMICs: they lead to work and school interruptions, loss of productivity, and very high health and socioeconomic costs for victims, families, and countries. A 2017 study showed that a 50% reduction in road accident injuries and deaths could generate an additional income stream of 7–22% of GDP in some LMICs (7).

Despite this burden, it remains unclear which policies and interventions are effective in reducing VPIs in LMICs. Some literature reviews have explored this topic, but were either limited to HICs or were not focused on pedestrian victims (8–11), and there are several urgent reasons to review literature specifically focused on VPIs in LMICs. Firstly, the contexts differ greatly between HICs and LMICs, and, arguably, even between LMICs. While income level is associated with stratification of the burden between countries, it is reasonable to assume that the effectiveness of interventions may also vary according to countries' wealth levels or other sociocultural characteristics (11). Secondly, while many different policies can reduce road accidents, their effectiveness in reducing morbidity and mortality varies by the type of user. This review focuses strictly on interventions to reduce the risk of pedestrians – the most vulnerable of road users. In the same vein, it was decided to limit the literature review to studies that examined environmental measures to reduce VPIs, i.e., those interventions that act on the built environment and are described as 'passive' because they require no effort or participation on the part of the individual being protected (12). By adopting a systemic approach, environmental measures are highly successful since they bring about lasting changes that act on all individuals, whatever their age, sex, state of health, literacy, behavior, or socioeconomic level (13,14). Finally, these measures contribute to reducing health inequities, which is of particular interest for LMICs (12,15).

This scoping review aims to understand the nature and extent of the understudied phenomenon of VPIs and the environmental interventions implemented in LMICs to reduce them. By filling this important

gap, we hope to help inform national authorities of the best strategies for improving pedestrian road safety.

Methods

Search strategy

The review followed the approach advocated by Arksey and O'Malley (16) for conducting scoping reviews, which comprises five steps: (1) formulation of the research question; (2) identification of relevant studies; (3) selection of studies according to inclusion and exclusion criteria; (4) extraction and mapping of data categorized according to key findings; and (5) reporting of results. The PRISMASCR checklist (Preferred Reporting Items for Systematic Reviews and Meta-Analysis Extension for Scoping Reviews) was used to report, filter, and communicate our results (Appendix) (17). The protocol was not published.

The first step consisted of identifying the three key concepts that guided this literature search: 'road accidents,' 'pedestrians,' and 'environmental measures' (see Appendix 1). A limited search was performed in Google Scholar to identify additional terms and synonyms used in the literature to refer to these concepts. The complete list was discussed among the authors to seek additional suggestions, and derived MESH (Medical Subject Heading) terms were identified.

In the second step, all identified keywords and MESH terms were searched in three databases: Medline, Google Scholar, and the Transport Research International Documentation database. There was no time limit (the search was conducted in March 2022). Boolean operators (*and*, *or*) combined the keywords and their synonyms, and the truncation sign * was used at the end of the keywords when appropriate. The following search equation was generated:

((((road* *or* highway* *or* traffic) *and* (safety *or* security *or* accident* *or* injury* *or* crash* *or* collision*)) *and* pedestrian*) *or* (pedestrian-vehicle collision* *or* pedestrian-vehicle accident* *or* pedestrian-vehicle crash* *or* vehicle-pedestrian collision* *or* vehicle-pedestrian accident* *or* vehicle-pedestrian crash*)) *and* (urban* *or* town* *or* city *or* cities *or* built environment *or* city planning *or* road* *or* pedestrian* crossing* *or* street*)

This search equation was replicated across the three search engines. Although the search terms were all in English, publications in French were also considered.

Inclusion/exclusion criteria

All types of studies were considered in this review, regardless of methodology (quantitative, qualitative, mixed), design (experimental, descriptive, etc.), or format (peer-reviewed article, scientific presentation, case study, research report, etc.). All references were exported to Zotero, where duplicates were removed. Titles and abstracts were screened systematically, and any record that did not mention one or several LMIC(s) was removed (see Appendix 2). In a second stage, the articles were read entirely and two other exclusion criteria were applied: written in a language other than French or English; and not presenting original, empirical results. Lastly, only studies that focused on VPIs and environmental measures were retained for the review. The screening process was performed independently by two researchers; in case of a disagreement, a third researcher read the article in full and decided whether to include it or not. A PRISMA flow chart summarizes the number of records at each step of the screening process (Figure 1).

Data extraction and analysis

Since this was a scoping review, the quality of the included studies was not estimated based on a grading scale, as recommended elsewhere (18). Summary data were extracted using a matrix that specified the first author's name, the country of study, the study design, the intervention under study, and the study's main results. A descriptive qualitative analysis was carried out to examine and organize the results according to a thematic framework developed by the WHO (19) that has identified four main categories of environmental interventions to reduce VPIs: (1) traffic calming measures, which include interventions that reduce speed of motorists; (2) measures to reduce pedestrian exposure to

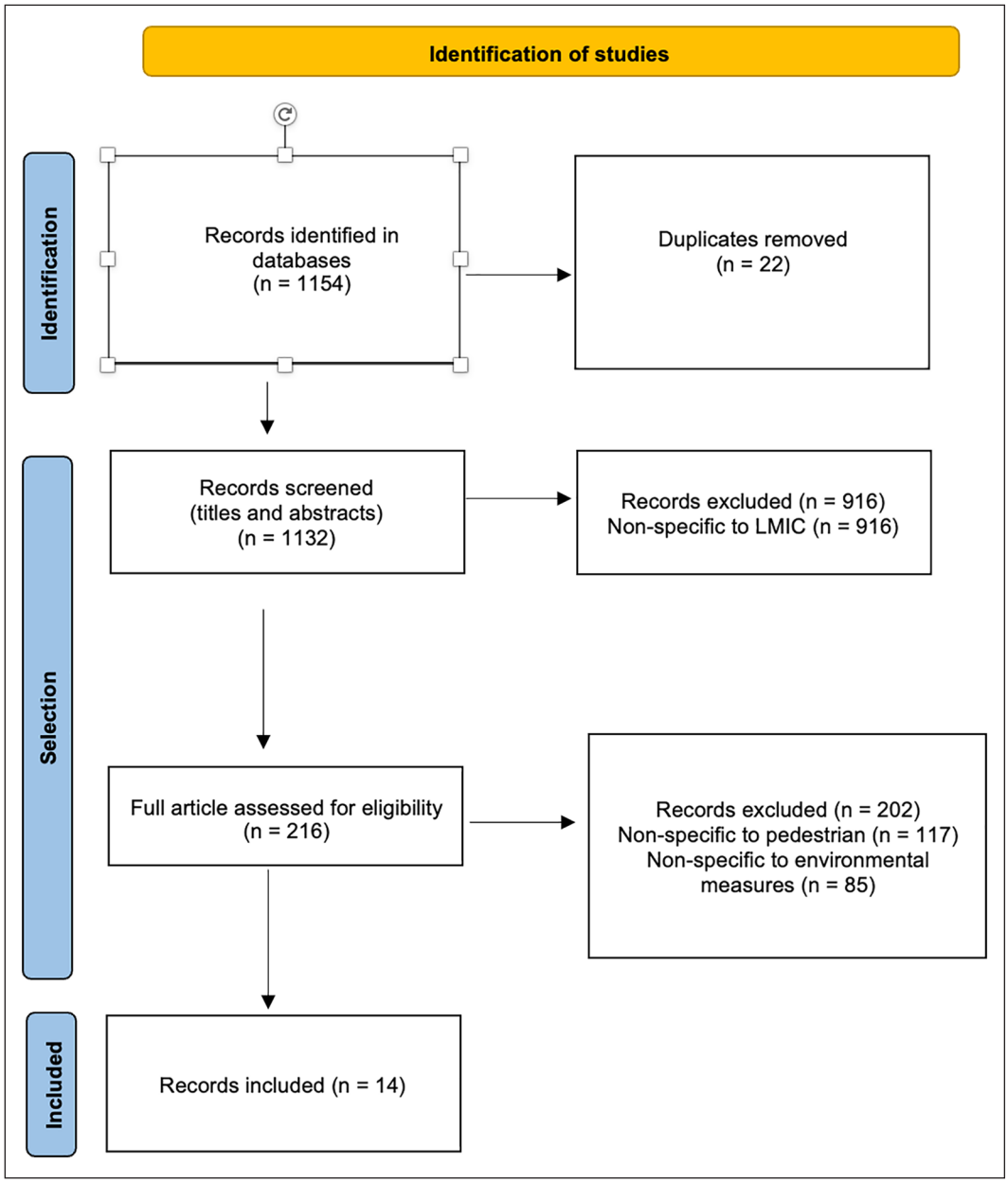

Figure 1. PRISMA flowchart for identification and selection of articles. LMIC, low- and middle-income countries.

vehicular traffic, including road improvements to better separate the different categories of road users or to reduce traffic volume; (3) measures to improve visibility for both pedestrians and motorists; and (4) improvements to vehicle design to maximize pedestrian protection, notably by promoting pedestrian safety assessments and other technical regulations or features.

Results

After consulting the three databases, 1154 articles were identified, of which 22 duplicates were identified and removed. Of these records, 14 articles dealing with environmental measures implemented in LMICs to reduce VPI risk were retained for the synthesis (Figure 1).

Among the 14 studies, 5 were carried out in Africa (South Africa and Ghana), 4 in Asia (India, Malaysia and Pakistan), and 5 in Latin America (Peru and Colombia). Most studies (12/14) used quantitative data only; the remaining 2 were mixed methods studies. Study designs included pre–post intervention, interrupted time series, case-control, and case study, but no randomized controlled trials met the inclusion criteria. All studies were carried out between 2003–2022 and focused on one of the environmental interventions identified by the WHO, although no study specifically considered improvements in vehicle design (Table 1). A visual representation of the main road features or interventions considered in the 14 studies is provided in Appendix 3.

Traffic calming measures

Three different groups of interventions were found in this category: traffic speed reduction measures or speed limits (20–22), vertical deviations, and horizontal deviations (20,23,24). Vertical deviations, like speed bumps, speed cushions, and raised intersections, are rounded, raised features that slow down traffic. Horizontal deviations are typically curb-line arrangements (i.e., chicanes, which require vehicles to follow an S-shaped path) on either side of a two-lane road, road narrowing, or central islands. These measures create a safer and more controlled driving environment, particularly when they are employed together.

Reducing the speed of motor vehicles using environmental measures has great potential to reduce VPIs. In Ghana, the average speed of vehicles and the proportion of motorists exceeding 32 miles per hour (mph) were both statistically lower in areas with traffic calming measures than in control areas, and the risk of VPI was significantly higher in areas without traffic calming measures (odds ratio (OR) = 1.98) (20). In New Delhi, comparing four studies on the impact of speed on pedestrian safety, one study concluded that even small reductions in average speed significantly reduced pedestrian fatalities; a 1% reduction in average speed corresponded to a 7% reduction in pedestrian fatalities (22). The Peruvian study came to similar conclusions: high traffic volumes and high vehicle speeds were associated with a nearly eightfold increase (OR = 7.88) in the risk of mortality and a fivefold (OR = 5.35) increase in the risk of collisions involving child pedestrians (21).

In Colombia, the number of lanes was positively associated with pedestrian casualties ($\beta = 0.982$) suggesting that road diet (i.e., reducing the number of travel lanes and/or effective width of the road) can improve pedestrian safety and reduce VPIs (25).

Installing speed humps and extended speed bumps on road sections in two South African districts reduced the number of VPIs in the two areas by 23% (23). The median annual rate of severe collisions between pedestrians and vehicles per kilometer of road also decreased from 1.41 to 0.96 ($p = 0.007$) and from 2.35 to 1.40 ($p < 0.001$) in the two zones respectively (23). In Ghana, VPI severity was significantly lower in the presence of traffic calming measures such as speed humps and extended speed bumps. After adjustment for gender, age, and time of day, the risk of pedestrian death was higher (OR = 1.78) for road sections that did not implement traffic calming measures compared with sections that did (20). In towns where traffic calming plans include speed humps, fatal accidents for pedestrians were three times lower. Horizontal detour measures, such as barricades and chicanes, reduce drivers' field of vision, forcing them to reduce speed and be more attentive to their surroundings. These have been successful in Peru, where VPIs were less frequent in the presence of a chicane or barricade (OR = 0.11) (24).

Reducing pedestrian exposure

Many LMICs lack pedestrian-specific infrastructure (sidewalks, footpaths), meaning that roads are shared between pedestrians and other road users. As a result, pedestrians are more exposed to the risk of collision than in HICs (26). The literature has identified several road improvements that reduce pedestrians' exposure to the risk of collisions with vehicles, such as sidewalks, delineations separating pedestrians from road users, zebra crossings, crosswalks controlled by traffic lights, central medians and refuge islands, footbridges, and underpasses (21,25–31).

Table 1. Description of the studies included in the review.

Authors (Year)	*City, country*	*Type of study*	*Intervention/ feature under study*	*Main results and effectiveness of interventions*
Afukaar (2003)	Accra and Kumasi, Ghana	Pre–post intervention study	Rumble strip	Installing rumble strips on the main Accra-Kumasi freeway reduced accident CIPs and fatalities
Ahmed *et al.* (2021)	Putrajaya, Malaysia	Descriptive mixed methods study	Zebra crossing	(1) The zebra crossing was the most important to ensure pedestrian safety (2) The four interventions with the most significant impact were: speed limits, crosswalk provisions (time, width, and length of crosswalk), road signs and pedestrian traffic lights
Aidoo *et al.* (2013)	Accra, Ghana	Risk factor analysis Cross-sectional study	Street lightning Speed bumps	(1) In a pedestrian collision, hit-and-run accidents are favored by poor road lighting and weather conditions, poor road conditions, lack of a central median, etc. (2) The use of median separations, speed bumps and the installation of public lighting in road design and construction helps to reduce the risk of VPI and hit-and-run
Cantillo *et al.* (2015)	Bogota, Colombia	Risk factor analysis Cross-sectional study	Footbridges Crosswalks controlled by traffic lights	(1) Pedestrians' decision to cross a road, to use a footbridge or a signalized intersection is influenced by variables such as the safety/security and attractiveness of each alternative (2) These variables are, in turn, strongly determined by the individual's socioeconomic characteristics and conditioned by the circumstances of the journey (3) Distance to pedestrian bridges or signalized crosswalks is associated with dangerous crossings
Damsere-Derry *et al.* (2019)	Accra, Ghana	Matched case-control study	Speed control Speed cushions Speed bumps	(1) Average vehicle speeds, the proportion of vehicles exceeding the 50 km/h speed limit, and pedestrian fatalities were significantly lower in towns with traffic calming measures (2) Traffic calming devices, including Berliner cousins, were effective in reducing accidents
Donroe *et al.* (2008)	Lima, Peru	Case-control study	Speed control Curb between pedestrians and others	(1) High traffic volumes and high vehicle speeds are associated with the number of fatalities (2) The risk of collisions involving child pedestrians was increased by a high volume of vehicles, lack of lane demarcation, high vehicle speeds and a high density of street vendors
Khatoon *et al.* (2013)	New Delhi, India	Pre–post intervention study	Grade separator Underpass	(1) Dangerous crossings remain at intersections despite the existence of underpasses (2) Removing pedestrian traffic lights due to the underpass has increased speed variability
Nadesan-Reddy and Knight (2013)	Durban, South Africa	Time-series study	(Extended) speed bumps	Speed bumps are associated with a drop in pedestrian-vehicle severe collisions and fatal pedestrian collisions

(Continued)

Table 1. (Continued)

Authors (Year)	*City, country*	*Type of study*	*Intervention/ feature under study*	*Main results and effectiveness of interventions*
Quistberg *et al.* (2014)	Lima, Peru	Case-control study	Crosswalks controlled by traffic lights	(1) Collisions were more frequent in the presence of pedestrian signals (2) Longer duration of the pedestrian signal was associated with a higher risk of collision (3) Signals were associated with an increased risk of pedestrian-vehicle collision (4) The presence of a police officer was associated with a reduction in pedestrian collisions
Quistberg *et al.* (2015)	Lima, Peru	Case-control study	Sidewalk Curb between pedestrians and others Chicanes/ Barricade	(1) VPIs were less likely in the presence of a curb and sidewalk on both sides of the road and a pedestrian barricade (2) The risk of collision was higher in the presence of street vendors and of parked vehicles 3) VPIs were less frequent in the presence of a chicane or barricade
Goel (2021)	New Delhi, India	Meta-analysis of four cross-sectional studies	Speed reduction	(1) Small reductions in average speed translate into significant reductions in pedestrian fatalities
Umair *et al.* (2022)	Punjab, Pakistan	Risk factor and spatial analysis Cross-sectional study	Green belts and central open areas/islands Narrowing/raised medians Billboards at crossroads	(1) Central areas reduce the number of VPIs, as pedestrians cross the road more safely in two stages (2) Billboards at crossroads increase the occurrence of accidents and distract the drivers (3) Billboards and buildings over three storeys reduce motorists and pedestrians' visibility
Vergel-Tovar *et al.* (2020)	Bogota, Colombia	Risk factor analysis Cross-sectional study	Footbridges Road narrowing/ diet	(1) The presence of pedestrian bridges is positively associated with the number of road accidents for all road users (2) Lane width, number of lanes, longer crossing distances for pedestrians, and speeding are positively associated with a high probability of VPI (3) Density and distance to intersections are correlated with road safety
Sinclair and Zuidgeest (2015)	Cape Town, South Africa	Descriptive Cross-sectional study	Footbridges	(1) Pedestrians cross where it suits them best, not necessarily where it's safest or where there are crosswalks (2) The perception of danger and crime-related activities in/around footbridges influence pedestrian's decisions to use them, alongside common factors such as convenience, time savings, and perceived traffic risks (3) Jaywalking and crossings on the street occur near bridges

CIP, casualty incident profiles; VPI, vehicle–pedestrian injuries.

In Peru, a study showed that VPIs were less likely (OR = 0.19) in the presence of a curb and sidewalk on both sides of the road than in their absence (24). In addition, sidewalks with curbs or barricades were associated with significantly fewer VPI than sidewalks without them. Similarly, the absence of lane demarcations between pedestrians and other road users was associated with a sevenfold increase in the risk of collisions involving child pedestrians (OR = 6.59) (21). In Malaysia, zebra crossings were one of the most effective interventions to improve pedestrian safety, although their effectiveness was conditional on the time required for pedestrians to cross and the length and width of the zebra crossing (32). In Pakistan, medians and refuge islands were associated with a significant reduction in the number of VPIs ($\beta = -116{,}291$; $p = 0.038$), since they allow pedestrians to cross the road in two stages with a safe space in between (31). In Peru, the presence of a police officer at intersections to regulate traffic considerably reduced the risk of collisions between motor vehicles and pedestrians compared with unsupervised sites (OR = 0.05) (31).

In contrast, some interventions increased rather than decreased the risk of VPIs. Notably, traffic lights at crossroads increased the risk of VPI in Peru (OR = 8.88). Crossing during the pedestrian green signal was associated with a fivefold increase in collision risk for each 15-s increase in crossing time (OR = 5.31) (30). Footbridges and underpasses also showed mixed results, since pedestrians' decision whether or not to cross a road dangerously does not always depend on the presence of footbridges or underpasses, especially when they do not meet pedestrians' mobility needs (26). Many other factors, such as the convenience of underpasses and tunnels, their safety, time savings, and the perception of traffic-related risks, affect pedestrians' willingness to use them (25,28). The proximity of a pedestrian bridge was positively associated with the frequency and lethality of all-type road crashes, although it is unclear whether pedestrians were more at risk or not (25).

Installing rumble strips (road safety features that cause vibration and audible rumbling for motorists) to separate motor vehicles from pedestrians helped limit traffic speed and ultimately reduced the incidence of VPIs by 51% (33).

Improving pedestrian visibility

A major contributing factor to collisions and fatalities is poor lighting or visibility between pedestrians and other road users. Several studies included in our analysis have described factors affecting pedestrian visibility, how visibility influences safety, and what interventions can be implemented to improve it.

Two studies have suggested that high number and density of street vendors blocking roadways was associated with an increased risk of VPIs (ORs 1.25–2.82 (21,24)), which persisted even when controlling for pedestrian volume. Their location (mostly at street corners) exacerbated the risk since it interfered with visibility of cross-traffic. Reduced visibility because of street vendors was presented as a contributing factor to VPIs, distinct from higher density of pedestrians on the streets. The presence of poorly or illegally parked vehicles was also found to increase the risk of VPI by approximately four times (OR = 3.67) (24). Billboards, which attract road users' attention and reduce pedestrian visibility, were also associated with a statistically significant increase in VPIs when located near junctions or intersections ($\beta = 174.6771$, $p = 0.000$) (31).

Discussion

Our scoping review aimed to synthesize evidence on the effectiveness of environmental measures to mitigate the incidence of VPIs in LMICs. While several reviews have examined this topic in HICs, our scoping review found scant data for LMICs. This is especially problematic considering that available evidence indicates that some interventions and features can have heterogeneous effects depending on the context.

This review confirms that traffic calming interventions improve pedestrian safety. This is aligned with previous results from HICs indicating that, for example, the creation of 20 mph traffic zones was effective in reducing motorist speed and improving pedestrian safety (15,34–36). Speed management is not simply a matter of posting regulation signage. Existing speed limits are often disregarded, particularly when authorities have limited capacity to enforce them (19). Our review reveals that to effectively reduce motor vehicle speed, physical and environmental measures must

be implemented, such as road narrowing, deviations, speed bumps, or cushions. This is in line with previous evidence gathered in HICs showing that these road features increase drivers' anticipation of potential threats, enhance their attention and cognitive load, and ultimately lead them to reduce their speed (37–42). Despite their popularity as traffic intervention measures, no studies meeting our inclusion criteria examined the effectiveness of roundabouts to reduce VPI; the effects of these installations on pedestrian safety continue to be a source of debate in HICs (43,44).

There was a paucity of studies on VPIs in rural areas. This may simply reflect the higher incidence of VPIs in cities (45); however, highways between major cities of many LMICs are shared by pedestrians, cyclists, and motor vehicles and give rise to collisions that involve pedestrians. The proportion of fatal injuries shared by pedestrians and motorcycles on rural highways is significantly higher in LMICs than in HICs (36). Lethality for pedestrian victims is 2.3 times higher in rural than urban areas, likely due to higher vehicle speed, inferior road safety infrastructure, and limited access to emergency healthcare (36,46).

Of all the interventions identified in this review, only those designed to reduce pedestrian exposure appear to have mixed effectiveness in LMICs. Traffic lights at pedestrian crossings, footbridges, and underpasses were associated with an increased risk of VPI, in contrast to their protective effect in HICs (47–50). Several hypotheses can explain these conflicting results. When installed at inappropriate crossings (high-speed or multi-lane roads, locations with poor sight distance, and poor compliance with traffic rules), traffic lights can falsely inflate pedestrians' sense of safety, decrease their vigilance, and even increase their impatience, any of which can ultimately result in increased risk of VPIs (19). Individuals with limited access or with inability, such as wheelchair users or elderly people, may be at even higher risk. Similarly, underpasses and footbridges can increase the distance and effort required to cross a road, which limits their use (26,28). These places are often characterized by (or perceived to be associated with) a high incidence of crime, discouraging their use and nullifying their potential benefits.

Several psychological mechanisms can help clarify this behavior among pedestrians. Waiting time at a signal-controlled crossing is likely to impact the attitude of pedestrians waiting to cross: the longer they have to wait, the greater the risk of crossing on red. Evidence suggests that after a waiting time of 40 s, pedestrians are more inclined to feel impatient and to cross at a red light (35). This impatience can be tempered by systems that discourage pedestrians to cross, such as countdown timers that provide the remaining waiting time for pedestrians at intersections (35). Using the health belief model (i.e., the notion that an individual's beliefs influence health-related actions or behaviors), a study revealed that pedestrians were more likely to disregard signals at crossings when (1) they did not perceive any danger of collision, (2) they perceived fewer losses than gains, or (3) they did not have a strong sense of obligation to obey (51). In the same vein, a recent meta-analysis suggests that pedestrians' decision to cross (or not) was associated mainly with vehicle speed, gap size, and frequency of attempts (52). Their results are in line with those of the present study, and support the recommendations for traffic calming interventions and, to some extent, refuge islands or other midblock street crossings.

While the objective of the present scoping review was focused on pedestrian safety and the effectiveness of interventions, financial considerations cannot be ignored, particularly in contexts with limited resources. Unfortunately, none of the included studies has addressed these aspects. A recent systematic cost–benefit analysis of road safety measures suggests that this ratio can vary significantly between interventions (53). Although the latter analysis was focused on all road users' safety (not only pedestrians), its results have highlighted that some interventions included in this study were amongst the most cost-effective, namely traffic calming measures (speed humps) or rumble strips.

This scoping review is subject to some limitations. First, its scope was deliberately restricted to studies that examined passive, environmental interventions to reduce VPIs in LMICs. While there are 'active' interventions, such as road safety education for motorists and pedestrians, previous systematic reviews have found no evidence of their efficacy (in randomized controlled trials) to reduce injuries (54). This has led some experts to call for a shift in focus from cognitive behavioral to environmental interventions in promoting road safety (55), but active and passive

interventions cannot always be clearly separated; for example, we discovered that a passive feature (traffic lights at crossings) can produce different effects depending on the level of compliance from road users. Although interactions between different measures are likely, the evidence is very limited – only one of the studies considered in this review evaluated the effects of a combination of several interventions. Finally, this review did not take into consideration other types of vulnerable road users, such as cyclists and motorcyclists, despite the grievous and growing mortality burden among them (40,000 and 380,000 deaths annually, respectively) (56).

Conclusion

Our scoping review highlighted the effectiveness of some environmental interventions to reduce the risk of VPI in LMICs. Our results reveal that traffic calming measures and road improvements to increase visibility, notably at crossings, are promising strategies to reduce pedestrian injuries. Physical road features like barriers or pylons that separate pedestrians from other road users have also been tested successfully. Improving safety at crossings remains a challenge, since some interventions can be counterproductive by creating a false feeling of security or by increasing impatience.

Our scoping review highlights the importance of conducting in-depth studies reviewing the effectiveness of interventions to improve pedestrian safety in LMICs, to ensure that the interventions adopted are effective and sustainable. This requires a holistic approach involving key stakeholders such as local authorities, urban planners, road designers and local communities to design interventions tailored to local context. Environmental measures must also take into account the specific needs of pedestrians with physical limitations, such as children, the elderly, and other individuals with limited mobility, hearing, and vision.

Acknowledgements

The authors acknowledge support from the Réseau Francophone International pour la Promotion de la Santé, the Institut National de Santé Publique, the Ministère des Relations Internationales et de la Francophonie du Québec, and the library services at University of Montreal. We thank Mrs. Loula Burton for proofreading the manuscript.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: this scoping review received funding from the Réseau Francophone International pour la Promotion de la Santé. TD is a FRQS J1 Research Scholar. The funding agency had no role in the design of the study; the collection, analysis, and interpretation of data; in the writing of the draft; or in the decision to submit the manuscript.

Ethics approval and consent to participate

Approval from a research ethics committee was not required to conduct this systematic scoping review. There was no participant.

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Supplemental material

Supplemental material for this article is available online.

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Original Article

SDGs and public health policies: implementing the S2D grid in the city of Lausanne, Switzerland

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Abstract: Sustainable development goals (SDGs) and public health are often considered as separate policy fields, whereas there is a considerable potential in better coordinating their objectives and measures. Using an analytical grid (S2D grid) linking SDGs and public health objectives and comprising 6 thematic issues and 56 categories, the research team conducted an assessment of health promotion programs in the city of Lausanne, Switzerland. Their objective was to determine whether SDGs and public health concerns can translate into complementary policy objectives, and what was the level of achievement of Lausanne in terms of implementation, intersectoral collaboration and avoidance of redundancy, regarding the vast array of measures potentially dealing with SDGs and health promotion. Results show that measures implemented by Lausanne deal with 80% of categories included in the S2D grid, with a high level of intersectorality and a low level of redundancy. These results also emphasize the fact that linkages between SDGs and health promotion go well beyond the SDG 3 dedicated to 'good health and well-being', and that the S2D grid could be used as a tool in favor of organizational change, promoting the collaboration between stakeholders often reluctant to engage in public health policies.

Keywords: health promotion, policy/politics, determinants of health

Introduction

During the 23rd World Conference on Health Promotion, which took place in April 2019 in New Zealand, a sub-plenary session was dedicated to 'Implementing the Sustainable Development Goals at the Local Level: The Example of Francophone Healthy Cities'. Based on an analytical framework developed from a selection of sustainable development goals (SDGs), S2D grid, which was discussed during the subplenary session, this article aims to present and analyze the results of applying the S2D grid to the city of Lausanne, Switzerland. The objective is twofold: first, from a conceptual perspective, discussing how the apparent tension between the achievement of SDGs and health promotion policies can be addressed at the city level through the use of an adequate framework; second, from an empirical perspective, assessing the degree to which a municipality can implement measures in line with the SDGs' targets and local health strategies, taking into account relevant target groups, promoting intersectorality and avoiding redundancy.

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(This manuscript was submitted on 27 February 2023. Following blind peer review, it was accepted for publication on 21 February 2024.)

Global Health Promotion 1757-9759; Vol 31(4): 56–65; 1238009 DOI: 10.1177/17579759241238009 journals.sagepub.com/home/ghp

The Swiss health system

Switzerland is a federal state whose public health system is based on three different levels of competencies: communal (municipal), cantonal, and federal. The principle of subsidiarity implies that the vast majority of public health financing and provision, including health prevention and promotion, is a cantonal task. However, since the 1990s, and following legislative changes, a growing entanglement of competencies has progressively blurred the distinction between federal and cantonal levels (1). Furthermore, the health insurance system is largely privatized but regulated by the state, meaning for instance that the public/private mix changes between in- and outpatient care financing. In consequence, and from an institutional perspective, cities in Switzerland (communal level) do not usually play a key role in shaping public health policies.

Connecting sustainable development and health promotion

The idea of linking health promotion and sustainable development is not new and can be traced at least to the Ottawa Charter adopted in 1986 following the first International Conference on Health Promotion held by the World Health Organization (WHO). The document insists on a series of prerequisites for health, including peace, shelter, education, food, income, a stable ecosystem, sustainable resources, and social justice and equity, which all sound very similar to the SDGs (2). This call for a comprehensive approach to health promotion was continuously reaffirmed during the following international conferences (Adelaide in 1988, Sundsvall in 1991, Jakarta in 1997, etc.) (3) leading in 2010 to the Adelaide Statement on 'Health in All Policies' (HiAP), acknowledging the fact that health issues should be considered and dealt with according to an intersectoral approach, not confined to health ministers, and a multilevel governance, gathering national, regional, and local levels (4). More recently, the WHO has established a 'New Urban Agenda' and developed the concept of health in urban and territorial planning (UTP), in an attempt to explicitly link the HiAP approach with the SDG framework and emphasizing the role played by a broader array of actors, notably at the city level (5,6). Indeed, the local level, in the face of complex interrelated health issues, appears to address more easily 'spatial and cognitive conditions' necessary to successfully achieve a collaboration between several stakeholders (7).

In Switzerland, it is interesting to note that, in the field of environmental and sustainable development policies, the key player is the Confederation (federal state), not the cantons, leading to an even greater complexity in the design of policies linking health and sustainable development issues. This is notably illustrated by the case of the Swiss National Environmental Health Action Plan (NEHAP), a strategic plan aiming at implementing policies in the field of environmental health and developed in relation to the National Strategy of Sustainable Development (NSSD). The Swiss NEHAP was abandoned in 2007 partly due to the strong subsidiarity preventing the federal section in charge of the NEHAP from effectively collaborating with cantons (8). To this day, Switzerland remains without a NEHAP, an exception in Western Europe.

The relationship between SDGs, and more generally sustainable development policies, and health promotion has often been characterized by a tension between two antagonist views. On the one hand, health has generally been envisioned as a subcategory of the social dimension in many sustainable development representations (along with environmental and economic dimensions), notably within United Nations (UN) organizations (8,9). In that sense, the fact that SDG 3 specifically addresses health and well-being, 'Ensure healthy lives and promote well-being for all at all ages', comes as no surprise. The Swiss NSSD (2016–2019) retained this approach and dedicated one of its nine chapters to health, combining objectives for instance related to the burden of disease of non-communicable diseases, the provision of medical staff or the level of physical activity among the population, without any explicit overarching framework other than the reference to SDG 3 (10). On the other hand, and following systemic approaches to health, for instance inspired by the concept of environmental health, several scholars have acknowledged the necessity to use a multidimensional, cross-disciplinary, and cross-sectoral approach to correctly assess the intrinsic complexity of health determinants (11–13). According to that perspective, connections between SDGs and health determinants are everywhere (14).

In the same vein, it can be observed that the 11 qualities of healthy cities[1] are compatible with the 17 SDGs (15). Evidently, the added value of the SDG framework for public health policies lies in its institutional pervasiveness, most organizations and administrations, from the local to the international level, referring to it.

In summary, there are several factors that tend to explain the disconnect between sustainable development and public health policies. First, from an institutional perspective, levels of policymaking might simply not be aligned. This is typically the case in Switzerland with communal, cantonal, and federal levels overseeing different policy domains. Belgium is another example of such a discrepancy, health and environmental policies relying on different governance levels (respectively communities and regions) (16). Second, from an actors' perspective, national ministers and local administrations can be reluctant to share their competencies or prerogatives, especially in the absence of strong incentives. Again, this has often been the case in Switzerland, between policy actors at the cantonal level (siloed approach), and between actors at the federal and cantonal levels (strong subsidiarity principle). Third, from a conceptual perspective, the disconnect between sustainable development and public health policies arises from the notion that sustainable development policies somehow encompass (environmental) health policies, thus contributing to the development of health policies limited in their scope and far from corresponding to their systemic nature.

Methodology

The epistemological approach followed here is largely pragmatic (17) and responds to stakeholders' needs (health practitioners and decision-makers in municipalities) to have a practical instrument allowing them to take the SDGs into account, while implementing health promotion policies at the local level. It is therefore an *ad hoc* tool, tested iteratively in order to meet the expectations of those in the field. The research team first developed an analytical framework of health promotion measures, based on a grid designed by S2D, the *Association Internationale pour la Santé et le Développement Durable* (International Association for Health and Sustainable Development), which they then applied to Lausanne, a city of approximately 140,000 inhabitants located in the French-speaking area of Switzerland and notably known to host the International Olympic Committee. The parliament of the municipality is composed of 100 deputies representing six political parties, whereas the government, whose seven members are elected by the people, represents four political parties, with a strong left-wing majority (2016–2021). The city does not have any legal obligation to implement health promotion or sustainable development policies, nor does it receive any significant incentive from the cantonal or federal authorities to do so. It is therefore following the municipal political ambition that Lausanne has established itself as a pioneer in that field, serving as a role model for surrounding communes and cities across Switzerland. The analysis was conducted in 2018–2019 by the Institute of Global Health at the University of Geneva, following a mandate from the municipal authorities, and financially supported by the national foundation 'Swiss Health Promotion' with the aim of offering the city's example to the 'Union of Swiss Cities', the main association in the country defending political interests of cities, notably at the federal level. The municipality's objective was to produce an initial diagnosis of the city's health promotion policies in relation to the SDGs, and to identify potential areas of improvement, given their focus on three main objectives: healthy diet, physical activity, and social cohesion. This focus reflected a political decision taken before any discussion was engaged with the University of Geneva and before considering the integration of health promotion and sustainable development policies.

Design of the S2D grid

The first step was to define which of the 169 SDG targets were relevant at the local level (municipality) and clearly related to health determinants (Table 1). An example of target not retained would be 2.b: 'Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round'. Indeed, its relationship to health determinants is not clear. Another example would be target 1.b: 'Create sound

Table 1. SDG targets related to health and relevant at the local level (represented by shaded cells).

SDG	*SDG target*																		
1	1.1	1.2	1.3	1.4	1.5	1.a	1.b												
2	2.1	2.2	2.3	2.4	2.5	2.a	2.b	2.c											
3	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	3.a	3.b	3.c	3.d						
4	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.a	4.b	4.c									
5	5.1	5.2	5.3	5.4	5.5	5.6	5.a	5.b	5.c										
6	6.1	6.2	6.3	6.4	6.5	6.6	6.a	6.b											
7	7.1	7.2	7.3	7.a	7.b														
8	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	8.10	8.a	8.b							
9	9.1	9.2	9.3	9.4	9.5	9.a	9.b	9.c											
10	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.a	10.b	10.c									
11	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.a	11.b	11.c									
12	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.a	12.b	12.c								
13	13.1	13.2	13.3	13.a	13.b														
14	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.a	14.b	14.c									
15	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	15.a	15.b	15.c							
16	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	16.10	16.a	16.b							
17	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	17.10	17.11	17.12	17.13	17.14	17.15	17.16	17.17	17.18	17.19

policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions'. This time, it is the relationship to a local level of implementation which is absent.

Second, these targets were then classified into 56 categories according to the 6 following thematic issues: (i) environment with 13 categories, (ii) production and economy with 13 categories, (iii) social cohesion and equity with 10 categories, (iv) prevention and promotion of individual health with 5 categories, (v) urban governance with 10 categories, and (vi) development aid and international cooperation with 5 categories. Urban noise (thematic issue 1) and local projects in social cohesion (thematic issue 3) were not part of the SDG framework and were added. The objective was to sort SDG targets in a more meaningful way, that is likely to correspond to concrete measures implemented at the local level. This was done following the grid created by the École Nationale Supérieure des Mines to analyze European Agendas 21 (18).

Application to the city of Lausanne

Third, data were collected from the three main health programs conducted at the city level in Lausanne. 'Global Active City', an international network aimed at promoting physical activity and tackling non-communicable disabilities and supported by the International Olympic Committee. 'Commune en santé' (Healthy municipalities), a Swiss network of French-speaking municipalities whose aim is notably to assess existing health promotion measures in six domains (municipality policies, leisure activities, family, school, occupational health, and public spaces) and identify corresponding needs. A successful process of assessment is awarded a label for a three-year period. 'Healthy Cities', a network established by the WHO and based on the concept of Health For All, on the Ottawa Charter, and on Agenda 21. Its aim is to promote a socioecological approach to health anchored at the local level and reward cities following a process of continuous improvement, rather than the achievement of specific targets. Approximately 1600 cities across the world are part of the network. Based on this collection, an exhaustive list of close to 250 health promotion measures was established, reflecting the content of the SDG targets mentioned previously. In addition, the following 10 target groups were considered: (i) feminine gender, (ii) vulnerable people (including migrants), (iii) poor people, (iv) disabled people, (v) pregnant women, (vi) infants, (vii) children, (viii) adolescents, (ix) young adults, and (x) the elderly. Finally, five degrees of intersectorality were also taken into account: (i) measure based on an integrated approach, (ii) measure based on a sectoral approach, (iii) temporary and sectoral measures, (iv) declaration of intent, and (v) not dealt with. Table 2 lists part of this process regarding the fifth thematic issue, 'Urban governance'.

Analysis of results in Lausanne

A total of 92 SDG targets (approximately 54% of the 169 SDG targets) have been identified as potentially corresponding to measures taking place at the local level and related to health promotion. It is interesting to note that, as far back as the 1990s, the vast majority of measures proposed in the framework of Agenda 21 were considered to be best implemented at the local level, hence the considerable success, at least in terms of strategy production, of Local Agenda 21 (19). However, not all SDGs are equally represented. Whereas SDGs 5 ('Achieve gender equality and empower all women and girls'), 7 ('Ensure access to affordable, reliable, sustainable and modern energy for all'), 8 ('Promote inclusive and sustainable economic growth, employment and decent work for all'), and 11 ('Make cities inclusive, safe, resilient and sustainable') have more than 80% of their targets related to a local health promotion perspective, this ratio is less than 30% for SDGs 14 ('Conserve and sustainably use the oceans, seas and marine resources'), 16 ('Promote just, peaceful and inclusive societies'), and 17 ('Revitalize the global partnership for sustainable development').

Looking at the measures actually implemented by the city of Lausanne in relation to the analytic grid presented previously (which uses 6 thematic issues and 56 categories), it appears that their distribution is extremely heterogeneous (see Figure 1), ranging from zero existing measure (for instance, regarding the category 'terrestrial and freshwater ecosystems') to more than 35 measures in the case of the category 'access to green spaces and safe public spaces'.

Table 2. Example of a thematic issue and its related SDG targets, categories and existing measures (in French) according to their degree of intersectorality.

	SDG target (s)	*Category*	*Degree of intersectorality*			
			1	*2*	*3*	*4*
5. Urban governance						
Community participation in water management issues	6.b	**40**				
Energy efficiency	7.3; 7.a	**41**	Lausanne Industrial Services policy			
Sustainable and resilient infrastructure	9.1	**42**	Communal Development Plan: principle A.5.1			
Sustainable urban planning, inclusive planification, and management	11.3	**43**	Communal Development Plan: principles A.5.1; B.1.1; B.2.1; B.3.1; C.1.1; C.1.2; C.2.1; C.2.2; D.1.1; D.1.2; D.1.4; D.1.7	Slow traffic areas; 'Adventure Land' in Malley	'Metahealth'	Health paths; 'United neighborhoods'
Economic, social, and environmental relationships between urban and rural areas	11.a	**44**	Holiday Activities	'Dinner's ready in Lausanne!'; Visits at the farm (children); Sustainable catering; Local food for kids at school	'One tree, one child'; Market ProSpecieRara	
Public markets and information on business sustainability	12.6; 12.7	**45**		Health criteria in calls for proposals	'Motivating factors'	
Resilience and adaptation to climate change	13.1; 13.3	**46**	Communal Development Plan: Adaptation to climate change; greenhouse gas reduction + fight against heat islands + heat waves information; Strategy for adaptation to climate change			
Fair and equitable share of energy resources profit	15.6; 2.5	**47**				
Organized crime	16.4	**48**				
Consistency of sustainable development policies	17.14	**49**	Child Friendly City; Age-friendly City; Raising awareness to environmental concerns (children); 'Mountain School' (children); Holiday Activities (children)	Catalogue of all services available to families in Lausanne	Educational landscape Lausanne Grand-Vennes	

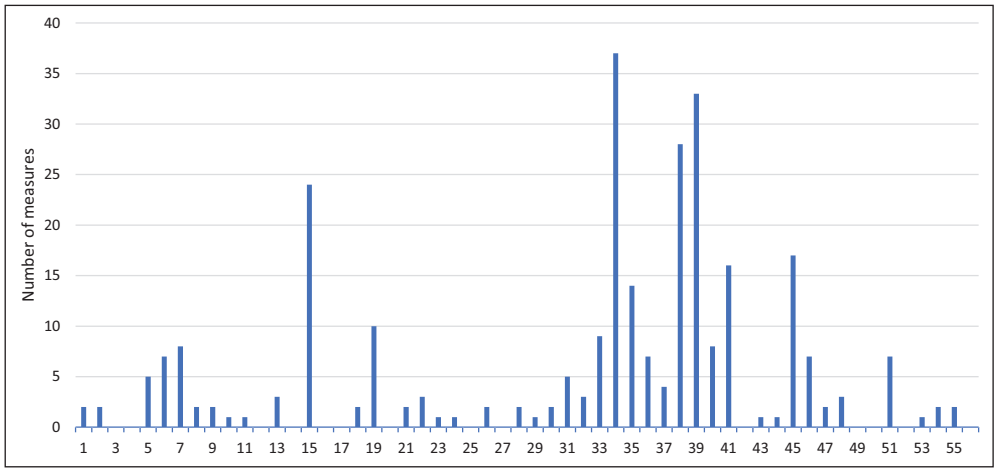

Figure 1. Number of measures for each of the 56 categories.

Overall, two thematic issues, social cohesion and equity and prevention and promotion of individual health, account for almost 60% of all measures implemented. The thematic issue 'development aid and and international cooperation' is quasi-inexistent with less than 2% of existing measures.

Furthermore, the significance of those measures largely varies, depending notably on the degree of intersectorality. For instance, the program 'One tree, one child', which has taken place on an annual basis since 2001 and aims at raising awareness on the importance of green spaces in urban settings by planting one tree for each newborn, does not have the same impact as the protection of forest areas inscribed in the municipal development plan. In order to account for that diversity, each of the 56 categories has been analyzed and ranked according to the scope and impact of the measures it encompasses. Six levels of implementation have then been identified (from the highest level to the lowest): (i) category is well covered, (ii) category is covered but there is room for improvement, (iii) category is not well covered or not enough information is available to determine the level of implementation, (iv) category is not well covered or not enough information is available to determine the level of implementation, however this category does not affect the main health promotion objectives of the city, (v) category is probably not relevant for the city (not enough information available to determine it), and (vi) category is not relevant for the city.

Based on this classification, three main findings can be highlighted. First, 33 of the 56 categories (59%) are either covered or well covered by measures implemented at the city level. This leaves only 8 categories insufficiently covered (14%) and 15 categories which are deemed at least partially irrelevant (27%). Second, some thematic issues are better covered by measures than others. In line with previous results, social cohesion and equity, and prevention and promotion of individual health are the two thematic issues with the highest level of implementation, at 70% and 100%, respectively. In contrast, production and economy only reaches 23% of categories (well) covered by measures implemented by the city. In consequence, this assessment reflects a promising situation with the vast majority of relevant SDG targets being dealt with by the city of Lausanne.

Nevertheless, several aspects of the city health promotion policy should be addressed. To begin with, 16 categories are covered by measures but could be improved and 5 others are insufficiently covered. This is primarily the case of the categories dealing with air quality, urban noise, biodiversity, sustainable food production, sustainable housing, access to green space and safe public spaces, and sustainable urban planning. Related health issues have indeed been sensitive, municipal representatives as well as the local population having expressed their concerns, notably regarding unsatisfactory levels of compliance with federal health standards.

Second, the listing of all health-promotion-related measures based on the three main health programs implemented by Lausanne shows their complementarity (most SDG targets are covered). However, it is hard to determine whether it reflects a strong synergy between health promotion programs or rather a lucky siloed process avoiding too much redundancy. Indeed, 'Global Active City' is focusing on measures related to physical activity, 'Commune en santé' has served as the basis for the city health promotion assessment, and 'Healthy Cities' is supposed to ensure the overall coherence of health-related measures with the SDG framework. A qualitative analysis of key stakeholders should then be conducted to evaluate their level of collaboration. The present analytical framework could be used to support such an endeavor.

Third, the relationship between the degree of intersectorality of existing measures and the overall level of implementation seems to clearly support the fact that more intersectorality leads to better results, i.e., categories with the highest levels of coverage (well covered). However, a closer look at data also shows that a few categories with the highest degree of intersectorality do not achieve the equivalent level in terms of implementation (this is, for instance, the case of measures related to categories 'soil quality' and 'biodiversity'). In addition, a couple of categories with lower degrees of intersectorality do achieve the highest level of implementation ('fair and universal access to water' and 'public markets and sustainable companies'). This observation calls for a more qualitative assessment of existing measures that could be based on interviews with municipal representatives, in order to better understand these few 'outliers'. Furthermore, the identified intersectoral measures will be subject to in-depth discussion with Lausanne's administrative authorities, so that their full potential can be acknowledged from a policy perspective.

Discussion

On the one hand, these preliminary results seem to indicate that measures implemented represent a systemic and relatively intersectoral effort developed by local authorities. On the other hand, they also point to a significant potential regarding the consideration of so far marginalized categories of measures, and an increased collaborative work during initial phases of policy development to notably avoid redundancy. It should also be pointed out that, in light of the general disconnect between sustainable development and public health policies, which seems to prevail in many countries, including Switzerland, the results obtained by the municipality of Lausanne indicate that, even in the presence of institutional barriers (e.g., conflicting levels of governance), policymaking at the local level has a lot of potential in circumventing these barriers. It can also be considered that the efforts made by Lausanne largely respond to the WHO's repeated call, made for instance explicit in the HiAP or UTP programs, for a better integration of local stakeholders and cities in health promotion policymaking. However, it should also be emphasized that these results were obtained by a municipality whose political leaders decided to play a proactive role,[2] in contrast to many situations where actors' interests tend to preserve a form of status quo (e.g., defense of ministers' prerogatives). Furthermore, it could be argued that the 'spatial and cognitive conditions' necessary to achieve this level of policy integration are indeed easier to obtain at the local level, where the number of measures concerned, though considerable (approximately 250), remains manageable and relatable for actors involved. Following our initial argument stating the city level might be better suited to dealing with the complex array of factors impacting health and sustainability issues, the relative success of Lausanne could partly explain the renewed interest in the role of cities in tackling those issues. Indeed, over the last 30 years, the number of 'theme cities networks' (20) has grown considerably, from Healthy Cities to Sustainable Cities or Age-Friendly Cities, acknowledging the capacity of municipalities to bring about positive policy change.

Conclusion

This article aimed at presenting an analytical grid developed to assess health promotion measures implemented at the local level in relation to the SDG targets. The city of Lausanne served to illustrate the potential of such an analytical tool in providing a comprehensive perspective on current, potential, and missing measures. From a conceptual perspective, it has been shown that linkages between SDG targets and health promotion policies are manifold, and that health considerations go

largely beyond the limited SDG 3 dedicated to 'good health and well-being'. In that sense, the S2D grid can be seen as a tool in favor of organizational change, if stakeholders having an influence on health promotion but traditionally reluctant to collaborate, acknowledge their role in light of this new 'theory-in-use' (21). Increased interorganizational governance could indeed be achieved thanks to the governing belief that health promotion and SDGs are deeply interrelated. From an empirical perspective, results obtained by Lausanne, and based on the analytical grid comprising 6 thematic issues and 56 categories explicitly comparable to the 169 SDG targets, tend to emphasize the global achievement of policies relevant both in terms of health promotion and sustainable development. It should also be noted that the analytical grid presented here is characterized by its versatility and potential usefulness in other local contexts. Furthermore, it could serve to measure the gap between an ideal situation, where all relevant categories identified are dealt with, there is no redundancy among measures taken and the degree of intersectorality is highest, and the current situation experienced by a municipality. In the case of Lausanne, this gap appears to be relatively limited: 80% of relevant categories are taken into account by existing measures, redundancy is very limited, and the degree of intersectorality is high. Finally, it should be noted that the S2D grid is designed to be applied in other municipalities and to achieve several goals: assessment of a particular health promotion program, communication between cities or departments, to be a benchmarking tool, and providing information for the public.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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Notes

1. According to Hancock and Duhl (22), these 11 qualities are: (1) a clean, safe, high-quality physical environment; (2) an ecosystem which is stable now and sustainable in the long term; (3) a strong, mutually supportive, and non-exploitive community; (4) a high degree of public participation in and control over the decisions affecting one's life, health, and well-being; (5) the meeting of basic needs for all the city's people; (6) access to a wide variety of experiences and resources with the possibility of multiple contacts, interaction, and communication; (7) a diverse, vital, and innovative city economy; (8) encouragement of connectedness with the past, with cultural and biological heritage, and with other groups and individuals; (9) a city form that is compatible with and enhances the above parameters and behaviors; (10) an optimum level of appropriate public-health and sick-care services accessible to all; and (11) high health status.
2. This proactive role of political leaders is not restricted to local administrations. In Switzerland, a federal counselor was responsible for the adoption of the first National Environmental Health Action Plan in 1998, out of personal interest and conviction, rather than a legislative basis (23).

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Original Article

Should organized sport characteristics be considered as a strategy for meeting physical activity guidelines in children?

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Abstract:

Background: A clearer understanding of the relationships between specific sport context with overall physical activity (PA) and sedentary time (ST) may contribute to the development of more accurate preventive strategies to increase children's engagement in PA.

Purpose: This study aimed to examine how different organized sports contributed to children's daily PA and ST.

Methods: PA was measured for seven days via accelerometers, in 410 children aged 6–10 years (49.8% boys). Of those, 332 (53.0% boys) were engaged in an organized sport and were further considered for statistical analyses. Parents reported children's sport participation (e.g. which sport, number of times per week, duration). The sports were classified into: indoor *vs*. outdoor; individuals *vs*. team; combat *vs*. individual aesthetic *vs*. racing *vs*. invasion. Children's height and weight were objectively collected. Multiple one-way analyses of covariance were used to examine the effects of sport characteristics on PA and ST. A linear regression, adjusted for children's sex, age, body mass index and father's educational level, determined the relationship between being involved in multiple PA and sedentary behaviours with Moderate to Vigorous PA (MVPA) levels.

Results: Although engaged in an organized sport, only 30% of the children achieved the PA recommendations. Sport (compared with active commute and active play) was the best contributor to daily MVPA. Outdoor sports (*vs*. indoor) contributed the most to vigorous PA (VPA) and MVPA. Team sports (*vs*. individual) were significantly associated with lower ST. Children in combat sports accumulated more VPA and MVPA, while those in racing sports showed a higher ST.

Conclusions: Sport participation alone does not guarantee children will reach the PA guidelines, and the type of sport can influence children's PA levels. Gender-stereotypes in sports may prevent girls from achieving their 60 minutes of MVPA daily.

Keywords: children, organized sports, MVPA, sedentary behaviour, accelerometer

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(This manuscript was submitted on 6 June 2023. Following blind peer review, it was accepted for publication on 16 February 2024.)

Global Health Promotion 1757-9759; Vol 31(4): 75–84; 1237525 DOI: 10.1177/17579759241237525 journals.sagepub.com/home/ghp

Introduction

Physical activity (PA) is associated with several health benefits (1). Current guidelines recommend children accrue 60 min of moderate-to-vigorous physical activity (MVPA) per day (2). However, in Portugal only 30% of children comply with the World Health Organization (WHO) PA guidelines (3). Sedentary time (ST) also increased gradually, which constitutes an additional and independent cardiovascular risk factor (4). Sports contribute between 23% and 60% of children's daily MVPA (5,6). Organized sport participation also seems more stable over time and has an important role in preventing and reducing childhood obesity (7). Previous studies have shown that most Portuguese children are engaged in an extracurricular sport (>50%) (8,9), but participation rates have declined (3,10) and are constantly lower among females (11).

Sport participation alone does not ensure concordance with PA guidelines, and both physical and sedentary behaviours may co-exist among paediatric lifestyles (12). More time in organized sports may result in reduced time in other activities, such as active play, and some organized sports include sedentary to light intensity activity (e.g. during instruction, or waiting one's turn) (13,14). Estimates of PA levels (e.g. typically based on metabolic rate) for different activities are available (15). However, most studies have been carried out in adolescents (16) and the amount of MVPA associated with various sports under field conditions is not completely understood. This study aims to examine how participation in organized sports with different characteristics contributes to children's daily PA and ST.

Materials and methods

Participants

The present study is part of the cross-sectional project ObesInCrisis, carried out in Portugal during the winter season of 2016/2017. The sampling design has been described elsewhere (17). Shortly, a total of 118 schools in the cities of Porto, Coimbra and Lisbon were included, with a total of 8472 children (mean age: 7.17 ± 1.91 years, 50.8% male); participation rates were 60%, 58% and 67%, respectively. All the children within those schools were eligible to participate. For this study, a subsample of 1st-to-4th grade school students from public schools, residing on the Portuguese Midlands was used. Children with missing information on accelerometry were excluded from the sample. Therefore, the sample comprises 410 children aged 6–10 years (8.39 ± 1.18 years). No child had a chronic health condition or disability that could influence their physical movement.

The study, conducted under the principles of the Declaration of Helsinki, was approved by the Portuguese Commission for Data Protection (REF:745/2017) and the Portuguese Ministry of Education (*Direção Geral do Ensino*; REF:0565500003). Written informed consent was obtained from the parents of participating children.

Instrumentation and procedure

Height and weight were measured by trained researchers at school, in the morning, using a portable stadiometer (SECA®, ADE MZ10042, Hamburg, Germany) and an electronic scale (SECA®, 813, Hamburg, Germany).

Parents filled in a questionnaire with the question: 'Does your child participate in any kind of organized sport?' (yes or no). Organized sport was defined as structured leisure time PA (outside school hours) that is supervised/guided by a coach or a teacher, and involves rules and formal practice. If yes, parents were asked to report the sport(s) practised by the child, the number of sessions per week and the duration (minutes) of each sport session in a typical week. Sports were classified according to: 1) the place where the activity typically takes place (indoor *vs*. outdoor/mix), 2) how the activity is played (individual *vs*. team/mix), and 3) the type of sport (combat, individual aesthetic, including net/court sports because of the sample size, racing, and invasion) as in previous works (18,19). In category 3, when the child practised more than one sport with opposite characteristics (e.g. swimming and football), the classification was made according to the dominant sport (more minutes per week). Those cases were included in 'outdoor or mix' and 'team or mix' in category 1 and category 2, respectively. Examples are available in the Supplemental material Table S1 online.

Parents answered to 1) 'How does your child usually get to and from school, and how much time does it take for each travel?' (Actively: walking or

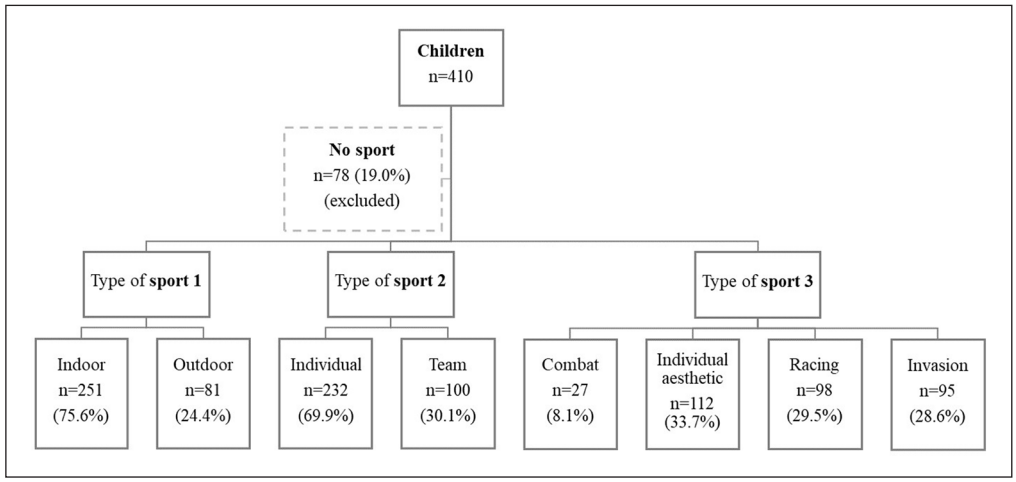

Figure 1. Flow chart of participants who practise and do not practise an organized sport. Examples for indoor sports: basketball and gymnastics; outdoor: football and tennis; individual: dancing and swimming; team: hockey and rugby; combat: judo and karate; individual aesthetic: dancing and yoga; racing: canoe and swimming; invasion: football and water polo. Complete classification of sports according to sports categories is available in Supplemental material Table S1 online.

cycling; Passively: motorized vehicles), 2) 'In his/her free time, about how much time per day is your child usually playing actively (e.g. running and jumping outside, or moving and fitness games inside)?', 3) 'In his/her free time, about how much time per day is your child usually engaged in non-screen-based activities, such as reading, puzzles, and dolls?', and 4) 'Outside school lessons, how much time does your child usually spend watching TV or using a computer, tablet, video game consoles, or smartphone?' Possible answers were none, 30 min/day, 60 min/day, 120 min/day, 180 min/day, 240 min/day, and 270 min/day. Father's educational level was classified as low (⩽9 years), medium (10 to 12 years) or high (university degree).

PA and ST were objectively measured for seven consecutive days. The tri-axial accelerometer, a w*GT3X-BT Actigraph*, was placed over the hip using an elastic belt above the right anterior superior iliac spine; a sample rate of 100 Hz (range 30–100 Hz) was selected. The filtered acceleration signal is digitized and the magnitude is summed over a user-specific period of time (epoch interval) set at 5 s. Participants were instructed to wear the accelerometer during all waking hours except while bathing or doing other water-based activities. Data were downloaded using the *ActiLife 6 software*.

Participants who did not complete a minimum of 600 min/day of accelerometer data after removing sequences of ⩾20 consecutive zero counts were defined as missing data (20,21). Accelerometer output was interpreted using intensity-based cut-points (e.g. sedentary, light, moderate, or vigorous PA). MVPA was calculated by adding the moderate PA (MPA) and the vigorous PA (VPA). Sub-components of PA were expressed in terms of minutes per day and calculated using a specific paediatric cut-point for children (22). Those who accumulated at least 60 min/day in MVPA (weekly average) were classified as meeting PA guidelines (2).

Data analysis

Of 410 children, 332 were engaged in an extracurricular sport (Figure 1). Supplemental Table S2 shows that children participating in a sport were more frequently male (53.0% *vs*. 47.0% females), had lower BMI (16.8 *vs*. 16.9) and a lower prevalence of overweight (14.8% *vs*. 17.6%) and were mostly from high-educated families (62.4% *vs*. 59.8%). Only children engaged in a sport were considered for further analyses.

Chi-square and Mann–Whitney *U*-test were used to compare differences between sexes in sport

Table 1. Descriptive characteristics (*n* and %, or mean and standard deviation) of participants engaged in an organized sport in total sample ($N = 332$), boys ($n = 176$) and girls ($n = 156$).

	Total	Boys	Girls	Statistical test
Sport category 1[a]				
Indoor	251 (75.6)	107 (60.8)	114 (92.3)	**$\chi^2(1) = 44.52$, $p < 0.001$**
Outdoor	81 (24.4)	69 (39.2)	12 (7.7)	
Sport category 2[a]				
Individual	232 (69.9)	85 (48.3)	147 (94.2)	**$\chi^2(1) = 82.91$, $p < 0.001$**
Team	100 (30.1)	91 (51.7)	9 (5.8)	
Sport category 3[a]				
Combat	27 (8.1)	20 (11.4)	7 (4.5)	**$\chi^2(3) = 120.12$, $p < 0.001$**
Individual aesthetic	112 (33.7)	19 (10.8)	93 (59.6)	
Racing	98 (29.5)	50 (28.4)	48 (30.8)	
Invasion	95 (28.6)	87 (49.4)	8 (5.1)	
PA guidelines[a]				
Not accomplished	220 (66.3)	101 (57.4)	119 (76.3)	**$\chi^2(1) = 13.21$, $p < 0.001$**
Accomplished	112 (33.7)	75 (42.6)	37 (23.7)	
BMI[b]	16.81 ± 2.61	16.61 ± 2.04	17.04 ± 3.11	$Z = -0.60$, $p = 0.55$
Activity on all days (min/day)[b]				
Sedentary	506.13 ± 88.29	491.99 ± 83.81	522.08 ± 90.75	**$Z = -2.69$, $p = 0.01$**
LPA	180.13 ± 37.22	182.62 ± 37.25	177.32 ± 37.09	$Z = -0.95$, $p = 0.35$
MPA	30.99 ± 9.36	33.29 ± 9.45	28.38 ± 8.56	**$Z = -4.61$, $p < 0.001$**
VPA	22.91 ± 10.65	24.39 ± 11.53	21.22 ± 9.32	**$Z = -2.39$, $p = 0.02$**
MVPA	53.89 ± 18.91	57.69 ± 19.81	49.60 ± 16.90	**$Z = -3.62$, $p < 0.001$**

Bold font denotes statistical significance at the $p < 0.05$ level.
[a]Tested by chi-square (χ^2).
[b]Tested by Mann–Whitney test.
PA: physical activity; BMI: body mass index; LPA: light physical activity; MPA: moderate physical activity; VPA: vigorous physical activity; MVPA: moderate-to-vigorous physical activity

participation (categories 1, 2 and 3), BMI, PA guidelines, ST, and PA intensity. To determine the effect of the sport categories (independent variables) in terms of PA intensity (dependent variables), multiple one-way analyses of covariance were run, controlling to children's sex, age, BMI, school, and father's education level. Homogeneity of variances (Levene's test > 0.05) was required in all the analyses. When statistically significant differences were found according to the sport categories, a post hoc Bonferroni test was used to determine specific effects on PA intensity. Linear regression was used to estimate the relationship between engagement (i.e. minutes per day) in sedentary (e.g. indoor play, screen time) and active activities (e.g. commute, sport participation, active play) and achieved daily MVPA. The model was adjusted to all the activities, children's sex, age, BMI, school, and father education. Significance was set at 5%; data were analysed using IBM SPSS, v.26 SPSS.

Results

The descriptive data of organized sports participation and characteristics of participants are presented in Table 1. Outdoor (39.2% *vs*. 7.7%) and team sports (51.7% *vs*. 5.8%) were significantly more common in boys than in girls, respectively. Invasion sports were more common among boys (49.4%), while girls were mostly involved in individual aesthetic sports (59.6%). The daily ST was significantly higher in girls than in boys, while the minutes per day in MPA, VPA and MVPA was significantly higher in boys compared with girls.

Table 2. Physical activity and sedentary levels (minutes per day) of children practising indoor or outdoor sports; one-way analysis of covariance.

Activity		Sport category 1		Statistical test
		Indoor	Outdoor	
Sedentary	*M* (SD)	510.28 (91.27)	495.95 (82.92)	$F(1,315) = 0.54$, $p = 0.49$, partial $\eta^2 = 0.00$
	M_{adj} (SE)	509.02 (5.78)	499.81 (10.66)	
LPA	*M* (SD)	178.35 (37.36)	181.47 (36.46)	$F(1,315) = 1.11$, $p = 0.37$, partial $\eta^2 = 0.00$
	M_{adj} (SE)	177.79 (2.38)	183.22 (4.38)	
MPA	*M* (SD)	29.90 (9.04)	33.43 (9.02)	**$F(1,315) = 5.01$, $p = 0.03$, partial $\eta^2 = 0.02$**
	M_{adj} (SE)	**30.09 (0.57)**	**32.86 (1.05)**	
VPA	*M* (SD)	21.95 (10.20)	25.52 (11.40)	**$F(1,315) = 5.98$, $p = 0.02$, partial $\eta^2 = 0.02$**
	M_{adj} (SE)	**21.94 (0.68)**	**25.54 (1.25)**	
MVPA	*M* (SD)	51.84 (18.15)	58.95 (19.24)	**$F(1,315) = 6.24$, $p = 0.01$, partial $\eta^2 = 0.02$**
	M_{adj} (SE)	**52.03 (1.17)**	**58.40 (2.17)**	

M_{adj}: = mean adjusted to children's sex, age, body mass index, school, and father's educational level; bold font denotes statistical significance at the $p < 0.05$ level.
M: mean; SD: standard deviation; SE: standard error; LPA: light physical activity; MPA: moderate physical activity; VPA: vigorous physical activity; MVPA: moderate-to-vigorous physical activity

Table 3. Physical activity and sedentary levels (minutes per day) of children practising individual or team sports; one-way analysis of covariance.

Activity		Sport category 2		Statistical test
		Individual	Team	
Sedentary	*M* (SD)	519.02 (87.53)	477.04 (87.27)	**$F(1,315) = 11.01$, $p = 0.00$, partial $\eta^2 = 0.03$**
	M_{adj} (SE)	**518.72 (6.01)**	**477.76 (9.98)**	
LPA	*M* (SD)	180.79 (35.89)	175.06 (39.82)	$F(1,315) = 1.87$, $p = 0.14$, partial $\eta^2 = 0.01$
	M_{adj} (SE)	181.18 (2.51)	174.13 (4.16)	
MPA	*M* (SD)	29.94 (8.87)	32.76 (9.55)	$F(1,315) = 0.76$, $p = 0.42$, partial $\eta^2 = 0.00$
	M_{adj} (SE)	30.45 (0.61)	31.53 (1.01)	
VPA	*M* (SD)	22.13 (10.13)	24.49 (11.56)	$F(1,315) = 1.08$, $p = 0.31$, partial $\eta^2 = 0.00$
	M_{adj} (SE)	22.37 (0.72)	23.92 (1.20)	
MVPA	*M* (SD)	52.08 (17.89)	57.25 (20.00)	$F(1,315) = 1.04$, $p = 0.33$, partial $\eta^2 = 0.00$
	M_{adj} (SE)	52.82 (1.25)	55.45 (2.08)	

M_{adj}: = mean adjusted to children's sex, age, body mass index, school, and father's educational level; bold font denotes statistical significance at the $p < 0.05$ level.
M: mean; SD: standard deviation; SE: standard error; LPA: light physical activity; MPA: moderate physical activity; VPA: vigorous physical activity; MVPA: moderate-to-vigorous physical activity

Boys were also significantly more likely to meet the PA guidelines than girls.

Children practising an outdoor sport accumulated significantly more MPA (~3 min/day), VPA (~4 min/day) and MVPA (~6 min/day) than children in indoor sports (Table 2), while children performing an individual sport accumulated significantly more ST (~41 min/day) than children in team sports (Table 3). There was a statistically significant difference between the type of sport and the daily VPA, MVPA and ST (Table 4). The post hoc test showed that children in combat sports accumulated more VPA

Table 4. Physical activity and sedentary levels (minutes per day) of children by sport categories (e.g. combat, individual aesthetic, racing or invasion sports); one-way analysis of covariance.

Activity		Sport category 3				Statistical test
		Combat	Individual aesthetic	Racing	Invasion	
Sedentary	*M* (SD)	502.42 (95.75)	516.27 (91.72)	526.46 (81.40)	475.61 (85.52)	***F*(3,313) = 4.68, *p* = 0.00,**
	M_{adj} (SE)	**508.78 (17.31)**	**508.36 (9.22)**	**530.56 (9.01)**	**479.35 (10.26)**	**partial η^2 = *0.04***
LPA	*M* (SD)	181.46 (29.41)	179.00 (37.26)	181.91 (35.52)	175.67 (40.67)	*F*(3,313) = 0.82, *p* = 0.46,
	M_{adj} (SE)	175.58 (7.25)	183.21 (3.86)	180.35 (3.77)	173.76 (4.30)	partial η^2 = *0.01*
MPA	*M* (SD)	32.21 (9.95)	29.94 (8.76)	29.33 (8.46)	32.88 (9.76)	*F*(3,313) = 2.15, *p* = 0.09,
	M_{adj} (SE)	30.88 (1.74)	31.95 (0.93)	28.88 (0.91)	31.23 (1.03)	partial η^2 = *0.02*
VPA	*M* (SD)	26.72 (11.91)	22.74 (9.73)	20.08 (9.43)	24.66 (11.79)	***F*(3,313) = 4.70, *p* = 0.00,**
	M_{adj} (SE)	**26.15 (2.05)**	**24.00 (1.09)**	**19.58 (1.07)**	**23.78 (1.21)**	**partial η^2 = *0.04***
MVPA	*M* (SD)	58.93 (21.29)	52.68 (17.58)	49.41 (16.41)	57.54 (20.42)	***F*(3,313) = 3.66, *p* = 0.01,**
	M_{adj} (SE)	**57.04 (3.56)**	**55.95 (1.90)**	**48.46 (1.86)**	**55.01 (2.11)**	**partial η^2 = *0.03***

M_{adj}: = mean adjusted to children's sex, age, body mass index, school, and father's educational level; bold font denotes statistical significance at the $p < 0.05$ level.
M: mean; SD: standard deviation; SE: standard error; LPA: light physical activity; MPA: moderate physical activity; VPA: vigorous physical activity; MVPA: moderate-to-vigorous physical activity

than those practising racing sports (~7 min/day). Individual aesthetic sports compared with racing sports also contributed to higher VPA (~4 min/day) and MVPA (~7 min/day). Inversely, racing sports contributed the most to ST (~51 min/day) compared with invasion sports. There were no statistically significant differences between the other groups.

A linear regression was used to test whether time in different activities significantly predicted the MVPA (Table 5). The overall regression was statistically significant and the model explained 12% of the variance in children's MVPA. After adjustment, children accumulated more minutes per day in MVPA if they spent more time in active play and in extracurricular sports; however, the coefficients' units were small (β = 0.03 and β = 0.20, respectively).

Table 5. Linear regression representing the relationship between time in physical and sedentary activities and children's daily moderate-to-vigorous physical activity.

	β	*t*	*p*-value
Active commute	0.02	0.26	0.80
Active play	**0.12**	**1.90**	**0.05**
Screen media use	–0.10	–1.67	0.10
Play indoor	–0.09	–1.35	0.18
Extracurricular sport	**0.20**	**3.25**	**0.00**
R	0.35		
F(10,259)	**3.62**		**<0.001**

Model is adjusted to all the variables plus children's sex, age, body mass index, school, and father education level; bold font denotes statistical significance at the $p < 0.05$ level.

Discussion

Only one third of children achieved the recommended 60 min/day of MVPA, even though they were engaged in organized sports. This is somewhat in line with previous studies, suggesting values between 20% and 30%, including in Portugal (3,23,24). The results highlight the need for more (and effective) strategies to achieve the global target of a 15% reduction in insufficient PA by 2030 (25).

A positive association between sport participation and accelerometer measured PA has been previously reported (26–29). We found that children who were practicing a sport (versus those not practicing any sport) accumulated ~4 min/day more of MVPA; the effect was greater in girls than in boys (although not statistically significant in any sex). Most children obtain PA from more than one context. Children are likely to engage in unorganized physical activities,

such as active commute and physical education classes, since these are less dependent on resources and parental involvement. It may be that children engaged in more unorganized PA will have less time and desire to practise an organized sport, explaining the similar MVPA values found in this study. Nevertheless, a higher MVPA level potentially resulting from participation in organized sports, even if small, can further benefit a wide range of health indicators in children, such as bone strength, motor development, fitness and psychosocial health (1).

Team and outdoor sports were the best contributors to children's PA, which is in line with previous studies (13,26,27,30,31). Racing sports contributed the most to children's daily ST, while combat and invasion sports were associated with greater VPA and MVPA. This is probably related to the class content (e.g. knowledge, management, game play and fitness) and the number of sessions per week. Most children practising racing sports, mostly swimming in our sample, had a single sport session (~60 min/week; data not shown), which is insufficient to increase overall weekly health-related PA levels (25). Swimming is a common sport in Portugal (32), including in the present sample, in which 27% of boys and 31% of girls were practising it (data not shown). However, if considering the duration per week, football (e.g. invasion sport) was the most played sport by boys, while gymnastics (e.g. individual aesthetic sport) was favoured by girls. Moreover, the accelerometer had to be removed during aquatic activities, which is a major limitation of the study. In fact, previous studies have suggested that swimming is a viable option to provide children with ample MVPA (33). For this reason, present findings should be interpreted with caution.

Boys seem to prefer MVPA in the form of team sports in which strength and competitiveness predominate, while girls often engage in MPA such as dancing or skating, or activities related to body shape and health with a more aesthetic orientation (34). A phenomenon of gendered sports seems evident, whereby certain sports may be seen as masculine or feminine (35). Sports segregation according to gender roles may be related to the fear of being judged or bullied if gender norms are not conformed to (Martínez-Andrés *et al.* (36)). Also, a previous study suggested an environmental mismatch in Portugal that undermines girls' opportunities to play sports (37).

Further research to understand why children choose to participate in certain sports is needed. Different activities may enhance different cognitive, social and motor skills, and high-demand sports, such as football, have shown to combine those abilities (38). Team sports seem to be more supportive in terms of strategy to fulfil PA recommendations, so motivating children to engage in team sports has the potential for improvement in terms of the total amount of daily PA. This may be particularly important for girls, since less than 24% of them were achieving the MVPA guidelines (*vs.* ~43% of boys), which is consistent with previous research showing that girls are often less active than boys, independently of age (11,39,40).

Implications for policy, practice, and equity

PA encompasses exercise, sports and physical activities performed as part of daily living, occupation, leisure or active transportation. The Global Action Plan on PA promotes all of those activities in children (plus reduction in screen time), considering that all movements count. In addition to personal and social development, sports may provide significantly more VPA than activities of daily living (e.g. transportation), which seems to be needed in order to achieve healthier body fat profiles (41).

Sports typically are not free. School-based programmes are a key component to increase sport participation and PA in children, particularly those from socioeconomically disadvantaged families. School programmes should accommodate children's preferences, since one of the most dominant factors related to sport dropout is participants' lack of enjoyment/fun (42). Simultaneously, physical education classes should be adapted to encourage children to try new sports (which may break sport-related gender stereotypes), as well as develop positive attitudes and behavioural skills. Media representation of female sport is another area of importance that can be intervened.

Limitations

PA was objectively measured. Sport participation data were collected using a standardized questionnaire, with little risk of recall bias (sports were being practised). Despite a large enough sample

to provide valid information, it is not possible to assert its representativeness. The analysis was adjusted for children's sex, age, BMI, school, and father's education, potential sources of confounding of PA levels and sport participation. However, the cross-sectional nature precludes any inference about causality, and we cannot rule out that results may be explained by unmeasured reverse causality or confounders. For instance, no factors affecting sports involvement and performance were collected (e.g. motor competence, sport preferences or reason to practise a specific sport). Underestimation of PA may have occurred because of 1) inherent limitations of the accelerometry to detect some types of PA (e.g. cycling) and to capture aquatic PA (e.g. swimming), and 2) the data collection during the winter season (e.g. decreased outdoor time).

Conclusions

Attaining the recommended levels of PA is a central aspect of health and wellbeing. An essential step in PA promotion is to identify and measure its suboptimal behaviours. Present findings suggest that sport participation may be a viable strategy to increase overall health-related PA levels. However, sport participation alone does not guarantee that children will reach the WHO PA guidelines. The manner and context in which a sport is delivered can dramatically influence the PA amount and intensity of participants. It seems necessary to break down gender stereotypical sporting behaviour to foster a diverse sport environment to both boys and girls and thereby contribute to their health.

Acknowledgements

We would like to thank the fund provider, participating schools, parents and children who made this study possible. The funding source has played no role in the research.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author.

Declaration of conflicting interests

The authors have no conflicts of interest to declare.

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by *Fundação para a Ciência e Tecnologia* (grant numbers 2020.03966.CEECIND and POCI-01-0145-FEDER-016688).

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Supplemental material

Supplemental material for this article is available online.

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Article original

Pour une défense collective face à la fatigue pandémique: l'urgence de renforcer les facteurs protecteurs

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Résumé: De nombreux articles publiés récemment ont laissé apparaître l'émergence d'un nouveau phénomène dans notre rapport avec la pandémie de COVID-19 : la fatigue pandémique. Ce phénomène suggère l'apparition d'une tendance générale de lassitude face aux mesures sanitaires et à l'état d'urgence devenu permanent. L'objectif de cet article est de replacer cet enjeu dans le contexte de la réalisation d'un projet de recherche portant sur les impacts psychosociaux durant la pandémie. Si relativement peu de recherches se sont intéressées à la fatigue pandémique, la réalité de ce phénomène a été mise en évidence dans le cadre d'un projet de recherche multi-annuelle effectuée durant la pandémie. En termes de méthode, notre équipe multidisciplinaire à l'Université de Sherbrooke a développé un protocole d'enquête permettant d'évaluer les effets de la pandémie de COVID-19 sur la santé mentale à travers des études transversales répétées. La dernière phase de l'enquête inclut un volet additionnel qui cherche à comprendre de quelle manière les conséquences de la pandémie peuvent s'appliquer à d'autres crises systémiques, notamment aux changements climatiques. Différentes vagues d'enquêtes nationales et internationales ont ainsi été réalisées (8 pays, taille minimale de l'échantillon 1000–1500 et échantillonnage par quota mis en oeuvre adapté à chaque pays et basé sur les données démographiques disponibles), et suivant l'évolution de la pandémie, nous avons introduit la notion de fatigue pandémique, ainsi que de fatigue climatique, afin de pouvoir mesurer l'impact de l'exposition prolongée à ces crises mondiales. Ces nouvelles données confirment nos résultats originaux : l'impact psychosocial de la pandémie est immense, en particulier en termes de fatigue pandémique, phénomène qui se retrouve à la fois au niveau comportemental et informationnel. Cette fatigue est un indicateur important à considérer afin d'améliorer notre capacité de réaction et d'adaptation à cette crise, mais également à celles futures.

Mots-clés : fatigue pandémique, fatigue climatique, fatigue de crises, impacts psychosociaux, résilience collective aux crises, facteurs protecteurs

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(*Ce manuscrit a été soumis le 21 mai 2022. Après évaluation par des pairs, il a été accepté pour publication le 29 novembre 2023.*)

Global Health Promotion 1757-9759; Vol 31(4): 92–101; 1223674 DOI: 10.1177/17579759231223674 journals.sagepub.com/home/ghp

L'émergence de la fatigue pandémique comme phénomène psychosocial et objet de recherche

De nombreux articles publiés dans la dernière année ont laissé apparaître l'émergence d'un nouveau phénomène dans notre rapport avec la pandémie de COVID-19 : la fatigue pandémique. Ces articles mentionnent notamment que ce phénomène peut par exemple accentuer le non-respect des gestes barrières (port du masque, distanciation physique, etc.) (1) ou renforcer les mouvements sociaux ou mobilisations contre les gouvernements (manifestations, occupations de lieux publics, etc.) (2). Fondés moins sur la science que sur des témoignages, ces articles soulignent tout de même l'apparition d'une tendance générale à la lassitude face aux mesures sanitaires et à l'état d'urgence devenu quasi permanent (3,4).

Bien que relativement peu de recherches se soient intéressées à la fatigue pandémique, la réalité et la complexité de ce phénomène ont été soulignées par nos résultats de recherche. Notre équipe de recherche multidisciplinaire à l'Université de Sherbrooke a développé un protocole d'enquête permettant d'évaluer les effets de la pandémie de COVID-19 sur la santé mentale à travers des études transversales répétées (5). Cette étude financée par les Instituts de recherche en santé du Canada cherche à évaluer les impacts psychosociaux de la pandémie (5, 6,7,8).

Nous mettons ainsi en évidence que la fatigue pandémique doit être prise en compte dans l'élaboration des réponses politiques et collectives en lien avec la pandémie qui, rappelons-le, est loin d'être terminée, au même titre que les autres indicateurs utilisés actuellement. Cette fatigue est un indicateur important à considérer afin d'améliorer notre capacité de réaction et d'adaptation à cette crise, mais également à celles futures.

Étant donné l'importance grandissante de la fatigue pandémique, mais également de la fatigue par rapport aux crises en général, il est urgent qu'une évaluation robuste et fondée sur des données probantes de ce phénomène permette de favoriser une plus grande résilience des individus et populations face aux crises.

Ceci est particulièrement important dans un contexte où cette situation de crise et d'urgence s'inscrit comme « nouvelle normalité » (9,10), non seulement dans le cas de la pandémie de COVID-19, mais également face aux crises multiples (11,12) auxquelles nous devons faire face, tels les changements climatiques, la crise du coût de la vie ou les guerres internationales. La notion de fatigue face aux crises nous apparait donc comme un important objet de recherche devant faire l'objet d'une attention accrue de la part des chercheurs et praticiens.

La dernière phase de l'enquête inclut à ce titre un volet additionnel qui cherche à comprendre de quelle manière les conséquences de la pandémie actuelle affecteront les futures communications en contexte de crise, notamment en lien avec les changements climatiques. Ce projet additionnel est financé par les Instituts de recherche en santé du Canada et Ouranos, un consortium sur la climatologie régionale et l'adaptation aux changements climatiques.

L'importance du concept de fatigue face aux crises a ainsi été rendue particulièrement visible dans notre projet avec l'ajout du concept de « fatigue climatique », phénomène qui peut se définir comme une lassitude à suivre les recommandations concernant les changements de comportements à adopter ainsi que par rapport à la surcharge informationnelle relativement aux changements climatiques. Cela a permis d'explorer la manière dont la fatigue s'applique également à la lutte contre les changements climatiques, où l'abondance d'informations négatives ainsi que la temporalité de longue durée favorisent une forme similaire de fatigue comportementale et informationnelle. Nos résultats, présentés plus loin, soulignent ainsi que des phénomènes similaires de fatigues comportementale et informationnelle peuvent être documentés, et ce, peu importe la nature des crises en présence (sanitaire, climatique, économique, politique, etc.), rappelant l'importance de prendre au sérieux cette fatigue dans l'élaboration des mesures mises en place pour répondre à ces crises.

Méthodologie et objectifs

Cette étude est la deuxième phase d'une enquête interdisciplinaire et internationale (menée dans huit pays de quatre continents) sur les impacts psychosociaux de la pandémie de COVID-19 chez les adultes, et ses facteurs de risque et de protection associés. Il s'agissait à l'origine d'une étude transversale répétée dans 8 pays (Canada, États-Unis, Angleterre, Suisse, Belgique, Hong Kong, Philippines et Nouvelle-Zélande).

Le recrutement des participants et la collecte des données ont été effectués par deux firmes de sondage pendant la période du 6 au 18 novembre 2020. Pour chaque pays, l'objectif minimal de l'échantillon a été fixé à 1000 adultes, à l'exception du Canada, où il a été fixé à 1500. L'échantillon a été tiré au hasard à partir de panels Web d'adultes de 18 ans et plus. Ceux-ci ont été recrutés volontairement en utilisant une multitude de stratégies, y compris un recrutement aléatoire, de la publicité dans les médias sociaux, par le biais de campagnes spécifiques ou en utilisant des panels de partenaires. L'échantillonnage par quota mis en œuvre a été adapté à chaque pays et basé sur les dernières données démographiques disponibles tirées du recensement de ce pays. Étaient inclus ici les groupes d'âge (18–24 ans, 25–34 ans, 35–44 ans, 45–54 ans, 55–64 ans, ⩾65 ans), le sexe (femme, homme) et la région (par exemple, pour le Canada : Ontario, Québec, Colombie-Britannique, Alberta, Manitoba/Saskatchewan, provinces de l'Atlantique). Un recrutement minimum de 70 % des nombres estimés pour chaque caractéristique (âge, sexe et région) a été ciblé afin d'assurer la meilleure représentation possible dans l'échantillon. Les données collectées ont ensuite été pondérées par les distributions démographiques de la population pour atteindre l'échantillon représentatif final.

Une fois les participants contactés et leur éligibilité confirmée, une explication complète de l'objectif de l'étude, des méthodes de gestion des données et de l'assurance de la confidentialité a été fournie. L'enquête étant anonyme, toutes les informations personnelles sont restées confidentielles. La collecte des données a été réalisée à l'aide d'un questionnaire en ligne prétesté, disponible en français et en anglais. Le questionnaire contenait environ 80 questions fermées avec un temps de réponse d'environ 20 minutes.

Différentes vagues d'enquêtes nationales et internationales ont ainsi été réalisées, et suivant l'évolution de la pandémie, nous avons introduit la notion de fatigue pandémique, ainsi que celle de fatigue climatique, afin de pouvoir mesurer l'impact de l'exposition prolongée à ces crises mondiales. Ces nouvelles données confirment nos résultats originaux (5) : l'impact psychosocial de la pandémie est immense, en particulier en termes de fatigue pandémique, phénomène quise retrouve à la fois au niveau comportemental et informationnel.

La mesure de la fatigue pandémique s'est faite ici à partir d'une échelle validée à 6 items provenant du « Pandemic fatigue scale ». Les affirmations sont mesurées sur une échelle de 1 à 7, 1 correspondant à un désaccord total et 7 à un accord total. Les questions posées sont les suivantes : 1) Je suis fatigué(e) de toutes les discussions à propos de la COVID-19 dans les émissions de télévision, les journaux et la radio, etc. ; 2) Je suis fatigué(e) d'entendre parler de la COVID-19 ; 3) Lorsque des amis ou des membres de ma famille parlent de la COVID-19, j'essaie de changer de sujet, car je ne veux plus en parler ; 4) Je me sens épuisé(e) de suivre toutes les règlementations et mesures sanitaires autour de la COVID-19 ; 5) Je suis fatigué(e) de faire des sacrifices pour sauver ceux qui sont les plus vulnérables à la COVID-19 ; 6) Je n'ai plus la motivation pour lutter contre la COVID-19.

La mesure de la fatigue climatique a été adaptée de l'échelle de fatigue pandémique. Les mêmes items ont été utilisés, avec la même échelle de 1 à 7, mais modifiés pour interroger sur le changement climatique. Les questions posées sont les suivantes : 1) Je suis fatigué(e) de toutes les discussions à propos des changements climatiques dans les émissions de télévision, les journaux et la radio, etc. ; 2) Je suis fatigué(e) d'entendre parler des changements climatiques ; 3) Lorsque des amis ou des membres de ma famille parlent des changements climatiques, j'essaie de changer de sujet, car je ne veux plus en parler ; 4) Je me sens épuisée(e) de suivre toutes les règlementations autour des changements climatiques ; 5) Je suis fatigué(e) de faire des sacrifices pour sauver ceux qui sont les plus vulnérables aux changements climatiques ; 6) Je n'ai plus la motivation pour lutter contre les changements climatiques.

Résultats de recherche concernant la fatigue pandémique : un phénomène aux réalités multiples

L'Organisation mondiale de la Santé (OMS) s'est intéressée à la fatigue pandémique dès 2020, signalant que de nombreux pays avaient rapidement décelé la présence de ce phénomène. L'OMS définit cette fatigue comme d'une part une « démotivation à suivre les comportements préventifs recommandés par les autorités sanitaires, apparaissant progressivement au fil du temps et affectée par un certain nombre d'émotions, d'expériences et de perceptions » (13). Ce phénomène a été confirmé lors de notre étude (voir détails et méthodologie à la section précédente), avec les participants présentant des symptômes de fatigue

Tableau 1. Adhésion aux comportements préventifs contre la COVID-19 chez la population adulte du Québec selon le type de fatigue pandémique (1–17 octobre 2021).

	*Niveau faible d'adhésion aux mesures sanitaires** (11)*	*N'a pas d'intention de rester informé (e) sur les restrictions liées à la COVID-19*
Fatigue pandémique informationnelle		
Oui	21,6 %[a]	37,5 %[a]
Non	13,7 %[b]	18,6 %[b]
Fatigue pandémique comportementale		
Oui	30,7 %[a]	44,7 %[a]
Non	12,3 %[b]	23,2 %[b]
Fatigue pandémique (Tout type)		
Oui	25,6 %[a]	42,7 %[a]
Non	12,2 %[b]	19,2 %[b]

[a]Chaque lettre en indice désigne un sous-ensemble de catégories dont les proportions ne diffèrent pas significativement les unes des autres au niveau 0,05.
[b]Le score total de l'intention de porter un masque, de respecter la distanciation physique et de limiter les rassemblements (entre 3 et 21) a été divisé en quartile. Le quatrième quartile représente un niveau élevé d'adhésion aux mesures sanitaires.

pandémique exprimant d'être moins enclins à adhérer aux comportements préventifs contre la COVID-19 (Tableau 1).

D'autre part, la fatigue pandémique se traduit également par une lassitude des individus face à la surabondance d'informations concernant la pandémie, entraînant ainsi une diminution des efforts de recherche d'informations vérifiées et de qualité. Cela souligne la double dimension comportementale et informationnelle (14) de la fatigue pandémique entrainant ainsi une forme de démoralisation généralisée (15). Cette fatigue se traduit au niveau de modifications d'habitudes et de comportements (non-respect des mesures sanitaires) ainsi que dans la capacité des individus à comprendre et interpréter les informations en raison de leur surabondance.

Cette démotivation émerge progressivement au fil du temps et est notamment le fruit d'un certain nombre d'émotions, d'expériences et de perceptions en lien avec la pandémie (13,16). Étant subjective et contextuelle, la fatigue pandémique dépend notamment de facteurs individuels et populationnels, tels le revenu, les normes culturelles, le lieu et type d'emploi occupé par les individus, des facteurs physiques et de la capacité psychologique de ceux-ci (17). La fatigue pandémique semble également affecter en particulier les jeunes et les personnes isolées ou vivants seules, comme le montrent nos données de recherche (voir ci-dessous).

Le concept de fatigue pandémique met ainsi en évidence que lorsque continuellement exposés à une surcharge d'informations liées à la COVID-19 (informations quotidiennes et répétées sur le nombre d'infections, décès, changements de mesures, etc.), les individus sont à risque de développer une forme d'état d'alerte constant. C'est cet état d'alerte constant qui apparait émotionnellement épuisant (14) et induit, dans le temps, une forme de fatigue. La transmission en temps réel de ces informations concernant la pandémie, permettant en théorie une meilleure gouvernance des systèmes gouvernementaux et information des populations, peut ainsi avoir paradoxalement des répercussions négatives en matière d'anxiété et de stress. Nous pouvons le constater par le niveau de fatigue pandémique informationnelle plus élevé que le niveau de fatigue pandémique comportementale. En effet, 64,8 % de la population au Québec et 57,7 % de la population dans le reste du Canada présentent une fatigue pandémique informationnelle. Ceci comparé à 35,7 % de la population du Québec et un 34,4 % de la population dans le reste du Canada présentant de la fatigue pandémique comportementale. Ces éléments soulignent qu'il y a un coût important à la transparence et production d'informations sanitaires en temps réel, coût qui s'exprime chez les individus notamment en termes de fatigue.

L'OMS rappelle toutefois que la fatigue pandémique est « une réaction attendue et naturelle à la nature

prolongée de cette crise » (13), soulignant ici les risques induits spécifiquement par les évènements sanitaires s'inscrivant dans la longue durée, ce qui inclus une possible augmentation du non-respect des règles sanitaires en raison de cette fatigue. En effet, au fur et à mesure que les individus s'habituent à la présence du virus, les coûts du respect des restrictions peuvent commencer à peser plus lourd que les risques perçus (entre autres en raison de la fatigue informationnelle qui réduit la capacité à comprendre et interpréter ces risques), entraînant une lassitude elle-même affectée par l'environnement culturel, social et politique dans lequel évoluent les individus. La fatigue pandémique est ainsi corrélée à des symptômes allant du stress aux troubles obsessionnels compulsifs en passant par l'anxiété et la dépression, ce que nos résultats ont bien démontré (voir ci-dessous). L'épuisement émotionnel, le sentiment d'inefficacité au travail, la démotivation, l'insomnie et le désespoir sont une liste non exhaustive de ses manifestations (18).

La fatigue pandémique s'inscrit donc selon une logique « d'intersectionnalité », c'est-à-dire qu'une pluralité de facteurs se recoupe et s'entrecroise dans sa production. L'intersectionnalité représente ici « a way of understanding and analyzing the complexity in the world, in people, and in human experiences. [. . .] When it comes to social inequality, people's lives and the organization of power in a given society are better understood as being shaped not by a single axis of social division, be it race or gender or class, but by many axes that work together and influence each other. » (19).

Nos données démontrent par exemple que la fatigue pandémique est, entre autres, liée au niveau de vie, au type d'emploi occupé ou au niveau d'éducation (voir ci-dessous). Or, les individus les plus précaires sont bien souvent issus de populations minoritaires ou stigmatisées. Ces derniers sont par ailleurs surreprésentés dans les emplois les plus touchés par les mesures sanitaires (ouvriers, vente au détail, préposé aux bénéficiaires, etc.). On comprend alors mieux comment les différents facteurs socioéconomiques tendent à se croiser et ultimement à renforcer le phénomène de fatigue pandémique, la pandémie ne faisant ainsi qu'exacerber les inégalités systémiques et intersectionnelles déjà présentes, rappelant la nature multiforme et complexe de ce phénomène.

De la fatigue pandémique à la fatigue climatique : L'évolution de nos résultats de recherche

Nos différents projets de recherche mis en place dès le début de la pandémie nous ont ainsi permis de mesurer une forte prévalence de fatigue pandémique au Québec et au Canada, en particulier pour la période de l'automne 2021, et montrent que 49,6 % de la population au Québec et 47,7 % au Canada souffre de fatigue pandémique.

À ceci s'ajoutent les résultats sur la fatigue climatique, mesurée sur la même période, qui montrent que 22,9 % de la population au Québec et 29,1 % au Canada souffre de fatigue climatique. L'importance de ces phénomènes induit des modifications comportementales possiblement néfastes, telles le non-respect des règles sanitaires, la désinformation et mésinformation, la polarisation politique, le recours à la violence, etc. Ces fatigues se manifestent notamment au niveau informationnel, c'est-à-dire une fatigue en lien avec la surabondance d'informations ou de discussions concernant la pandémie (pour 64,8 % de la population au Québec et 57,7 % dans le reste du Canada) ou les changements climatiques (pour 27 % de la population au Québec et 31,7 % dans le reste du Canada), et au niveau comportemental, donc concernant le respect des mesures sanitaires (pour 35,7 % de la population au Québec et 34,4 % au Canada) ou les mesures pour lutter contre les changements climatiques (pour 19,0 % de la population au Québec et 23,9 % au Canada). On retrouve donc ici cette double dimension comportementale et informationnelle.

Ce phénomène implique également d'importants impacts sur la santé mentale. En effet, plus ces deux types de fatigue, pandémique et climatique, sont importants, plus le risque de développer de l'anxiété, de la dépression et des idées suicidaires augmente (Tableau 2).

Ces impacts psychosociaux peuvent se répercuter directement sur les systèmes de santé par l'intermédiaire d'une demande accrue de services de santé, participant à la surcharge de ces systèmes et rendant encore plus nécessaire la prise au sérieux des fatigues pandémique et climatique dans la gouvernance des systèmes de santé, en particulier en contexte de crises multiples (pandémies, changements climatiques, crises économiques, etc.).

Tableau 2. Réponse psychologique chez la population adulte du Québec selon la présence de fatigue pandémique et climatique (1–17 octobre 2021).

	Anxiété probable	*Dépression probable*	*Anxiété ou dépression probable*	*Idées suicidaires*
Présence de fatigue pandémique				
Oui	17,9 %	22,7 %	26,6 %	8,0 %
Non	8,7 %	11,5 %	13,8 %	4,9 %
Présence de fatigue climatique				
Oui	19,0 %	25,1 %	28,9 %	7,8 %
Non	11,6 %	14,7 %	17,6 %	6,0 %
Ensemble du Québec	13,3 %	17,1 %	20,2 %	6,4 %
Ensemble du Canada	21,9 %	25,6 %	31,3 %	9,4 %

Toutes les différences entre les groupes sont statistiquement significatives ($p < 0{,}05$).

Nos résultats de recherche soulignent également que le niveau de perception du risque a un lien significatif, et ce, autant avec la fatigue pandémique que la fatigue climatique. À ce niveau, moins le risque est adéquatement perçu, donc compris par les individus, plus le phénomène de fatigue est important, établissant de ce fait un lien clair entre ce phénomène et la disposition à s'informer et à changer de comportement.

En effet, 53,3 % des personnes qui perçoivent une menace faible pour soi ou sa famille présentent de la fatigue pandémique, comparativement à 40,6 % des personnes qui perçoivent une menace élevée pour soi ou sa famille. Un constat similaire peut être observé concernant le niveau de menace perçue pour le pays et/ou le monde : 67,5 % des personnes qui perçoivent une menace faible pour le pays et/ou le monde présentent de la fatigue pandémique, comparativement à 40,4 % des personnes qui perçoivent une menace élevée pour le pays et/ou le monde. Des constats similaires peuvent être observés concernant la fatigue climatique, où 26,7 % des personnes qui perçoivent une menace faible pour soi ou sa famille présentent de la fatigue climatique, comparativement à 13,7 % des personnes qui perçoivent une menace élevée pour soi ou sa famille. Aussi, 32,2 % des personnes qui perçoivent une menace faible pour le pays et/ou le monde présentent de la fatigue climatique, comparativement à 13,8 % des personnes qui perçoivent une menace élevée pour le pays et/ou le monde.

Cela est particulièrement préoccupant puisque l'on constate que le sentiment de posséder un faible niveau d'information a fortement tendance à accroître ces deux types de fatigue (pandémique et climatique). Nos résultats de recherche (Figure 1) soulignent ce phénomène où par exemple 65,9 % des répondants qui estimaient avoir un faible niveau d'information ont ressenti une fatigue pandémique, contre 48,2 % des répondants qui estimaient avoir un niveau d'information moyen ou élevé. Des résultats semblables sont observés concernant la fatigue climatique, où 29,8 % des répondants qui estimaient avoir un faible niveau d'information ont également ressenti une fatigue climatique, contre 21 % des répondants qui estimaient avoir un niveau d'information moyen ou élevé. Les personnes présentant une vision complotiste ont également deux fois plus tendance à développer une fatigue pandémique et 3,5 fois plus tendance à développer une fatigue climatique que celles qui n'adhèrent pas à cette vision (Figure 1). L'idéologie politique semble également avoir une influence sur les deux types de fatigue, pandémique et climatique, avec notamment une présence plus importante de ces phénomènes pour celles et ceux s'identifiant à une idéologie politique de droite (contrairement au centre et à la gauche).

Parallèlement, il apparait que les individus au niveau d'éducation plus faible sont davantage touchés par les phénomènes de fatigue pandémique et de fatigue climatique. Par exemple, plus de 52 % des répondants ayant un diplôme d'études collégiales, un diplôme d'études secondaires ou un niveau d'études inférieur ont ressenti une fatigue pandémique, contre 43 % des répondants ayant un diplôme universitaire. Un constat similaire peut être observé concernant la présence d'une fatigue climatique, où 28,7 % des répondants ayant un diplôme d'études secondaires et 24,5 % des répondants ayant un diplôme d'études

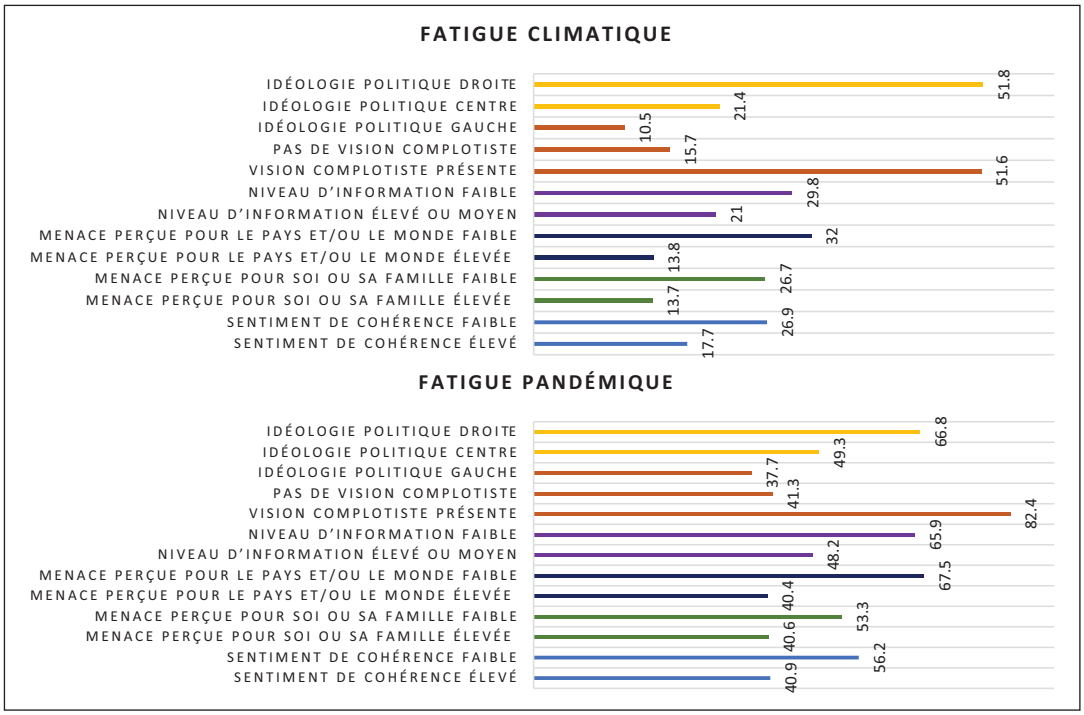

Figure 1. Fatigue pandémique et climatique selon les facteurs de risques.
Toutes différences entre groupes de facteurs sont statistiquement significatives ($p < 0{,}05$).

collégiales ont ressenti une fatigue climatique, contre 19 % des répondants ayant un diplôme universitaire.

Nos résultats de recherche soulignent donc amplement la réalité et les conséquences négatives des fatigues liées à la pandémie et aux changements climatiques, mais également aux autres crises (économique, politique, guerre, etc.), fatigues qui s'additionnent et accroissent les impacts sur la santé mentale. Il apparait donc essentiel d'adapter nos réponses politiques et sanitaires en s'appuyant sur des facteurs protecteurs permettant de construire et renforcer notre « immunité » face à la fatigue induite par les nombreuses crises actuelles.

Les facteurs protecteurs pour une résilience collective face aux crises

Pour faire face à la fatigue pandémique, mais également pour maximiser la résilience individuelle et collective face aux crises, il est urgent de développer une approche positive, de prévention et centrée sur les facteurs protecteurs. Ces facteurs protecteurs sont :1) l'adaptation du message par les autorités, 2) les capacités de réception de ces messages par la population, 3) le niveau d'éducation, et 4) l'action spécifique envers les groupes les plus affectés.

Une reconnaissance accrue et une action concertée envers ces facteurs protecteurs permettraient de favoriser une réelle « immunité collective » face aux conséquences psychosociales des crises actuelles (pandémie, et changements climatiques, notamment), mais également de renforcer nos défenses collectives pour répondre aux crises futures. Ceci est particulièrement important dans un contexte où les crises se multiplient et se juxtaposent, soulignant l'importance de se prémunir collectivement de la fatigue face aux crises en général.

Un premier facteur protecteur concerne donc ici l'importance d'adapter les messages informatifs et préventifs aux différentes catégories populationnelles visées afin de favoriser une meilleure compréhension

et perception des risques. Le phénomène de fatigue s'inscrit ici comme facteur favorisant la recherche de solutions et réponses simples à des phénomènes complexes (comme une pandémie ou les changements climatiques), ce qui accentue par le fait même l'adhésion au complotisme ainsi que l'augmentation de la polarisation politique. Ces risques devraient en particulier être mieux expliqués en fonction des différents groupes populationnels ainsi que mis en rapport avec l'ensemble des risques auxquels nous faisons face individuellement et collectivement.

La capacité de réception de ces messages devrait également être améliorée en mettant en place des mesures permettant aux individus de comprendre adéquatement l'information qui leur est transmise. Le développement d'une meilleure « littéracie scientifique » (capacité à comprendre et faire sens des informations et faits scientifiques) devrait ainsi être encouragé, au travers de programmes éducatifs adaptés, mais également d'approches d'éducation continue (en milieu de travail, par exemple). Cela permettrait d'agir à la fois sur la désinformation, la mésinformation et le complotisme, mais également sur la perception des risques, facteurs augmentant la fatigue autant pandémique que climatique.

Renforcer les niveaux d'éducation de la population ainsi que la qualité des programmes éducatifs apparait ainsi comme un facteur protecteur important et permet aussi de stimuler cette littéracie scientifique. Des programmes d'éducation renforcés, notamment au niveau scientifique, permettraient le développement d'outils d'analyse et de clés de compréhension, ce qui favoriserait l'atténuation de la fatigue informationnelle et comportementale. Par ailleurs, les individus avec un niveau d'éducation plus élevé bénéficient généralement d'un meilleur niveau de vie, ce qui a également un impact très concret sur cette fatigue en agissant au niveau des facteurs intersectionnels structurant ce phénomène. Lutter contre les inégalités, c'est donc lutter contre la fatigue informationnelle et comportementale, et donc ultimement, favoriser notre résilience. Par ailleurs, les personnes vivant seules, ayant des problèmes de santé qui se combinent aux risques sanitaires actuels, ou encore ayant des enfants, constituent des exemples de groupes populationnels nécessitants un soutien particulier, et donc la mise en place de services et programmes dédiés lors des crises.

Autre facteur protecteur, l'action auprès des catégories les plus touchées par cette fatigue pandémique ainsi que l'évitement d'une utilisation de bouc-émissaire, appelée aussi « bouc-émissairisation » (20,21), et de caractériser certains groupes comme responsables de la crise. Ce phénomène caractérise « un processus de stigmatisation, d'incrimination, de violence et enfin d'exclusion » (22,23). C'est le cas notamment des jeunes de 18 à 34 ans, catégorie particulièrement touchée (24) par la fatigue pandémique et qui a souvent été accusée d'être responsable de la transmission accélérée du virus (25,23) sans toutefois que leur propre état psychologique soit pris en compte.

Cet exemple met en évidence ici la nécessité d'éviter le ciblage disproportionné d'un sous-groupe de la population comme cause des crises. Cette tendance à la « bouc-émissairisation » n'a pour effet que d'inciter à la désinformation, la mésinformation et à l'abandon de certains comportements pourtant essentiels à la résolution des crises en cours. Ceci renforce également la polarisation au travers de l'exclusion symbolique ou manifeste du sous-groupe identifié comme le bouc émissaire, ce qui a pour résultats d'accroître également la fatigue (pandémique dans ce cas). Il apparait donc primordial de favoriser au contraire un sentiment de solidarité et d'appartenance collective plutôt que l'identification d'une catégorie de la population comme bouc émissaire de la crise, ce qui ne contribue qu'à diviser une population de plus en plus polarisée et génère de la fatigue. Ainsi, selon nos résultats de recherche, les personnes avec un sentiment d'appartenance élevé ont moins de tendances à développer une fatigue pandémique et même une fatigue climatique.

Conclusion : pour un retour du « public » en santé publique

Bien que présentant plusieurs limites (nombre de répondants, diversité des contextes politiques et culturels, contexte d'urgence et de crises, méthodes de recrutement diverses, etc.), ce projet nous rappelle la nécessité de mettre en place une stratégie de protection et prévention face aux impacts psychosociaux des crises (sanitaires, mais aussi climatiques et autres).

Reconstruire un espace public ouvert, protecteur et tolérant représente donc ici le facteur protecteur ultime qui se doit d'être renforcé. La population et ses

représentants (y compris les partis d'opposition, les groupes de citoyens et les leaders communautaires) doivent pouvoir se sentir libres et à l'aise de pouvoir critiquer et proposer des solutions alternatives aux décisions prises, mais aussi se sentir acceptés malgré leurs différents points de vue sur la crise. Ce facteur protecteur passe ainsi par un retour du « public » dans la santé publique. Comme l'a souligné l'OMS, les gouvernements doivent agir de manière à ce que les citoyens et les communautés puissent retrouver une certaine forme de pouvoir et d'autonomie dans leur vie quotidienne. Ils doivent sentir et percevoir qu'ils sont considérés comme des citoyens légitimes, même lorsqu'ils ne sont pas d'accord avec le gouvernement, ce qui passe par cinq principes fondamentaux selon l'OMS : la transparence, la cohérence, la prévisibilité, l'équité et la coordination (13).

Plus généralement, déployer des stratégies et actions favorisant un renforcement du sentiment de cohérence, c'est-à-dire de la capacité à « comprendre un événement stressant, à lui donner du sens et à le gérer » au travers du développement de ressources psychologiques appropriées (26) doit être favorisé.

Plus qu'un plan de reprise post-pandémique (27,28), et compte tenu de la multitude de crises auxquelles nous faisons face, c'est d'un « plan de résilience » pour faire face aux crises et centré sur le renforcement des facteurs protecteurs dont nous avons besoin. Ce plan se fait malheureusement toujours attendre, nous rendant plus vulnérables aux multiples crises que nous vivons (sanitaires, environnementales, économiques, politiques, etc.).

Ces leçons apprises doivent donc permettre de renforcer notre capacité de protection par rapport au phénomène de fatigue liée aux crises en général, et non pas à une crise en particulier. Bien que la pandémie de COVID-19 ne soit toujours pas derrière nous, cela ne doit pas nous empêcher de prendre en compte les impacts négatifs, notamment en termes de fatigue, des autres crises actuelles (changements climatiques, économie, guerres, etc.). Cette fatigue généralisée face aux crises menace nos mécanismes de défense collective, incluant nos systèmes de santé, appelant urgemment une réponse coordonnée et cohérente de nos sociétés. C'est de nos capacités collectives de résilience et de défense face aux crises dont il est question, capacités déjà largement mises à mal durant la pandémie.

Conflit d'intérêts

Aucun conflit d'intérêts déclaré.

Financement

Aucun financement déclaré.

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Article original

Les pratiques de l'action intersectorielle locale pour l'équité en santé : étude du cas *Quartier nourricier* de la Corporation de développement communautaire Centre-Sud à Montréal

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Résumé :

Introduction : Afin d'agir sur les inégalités de santé et les ressources locales promotrices de santé, les praticiens et les décideurs doivent être outillés pour pratiquer l'action intersectorielle locale. Planifier et optimiser ces partenariats demeure pourtant un défi en raison du manque de connaissances sur les processus menant à l'atteinte de leurs objectifs – ce qu'ils *font* et *comment*. Cette étude documente empiriquement, à l'aide d'une étude de cas, les pratiques de conception de l'action intersectorielle locale dans la démarche *Quartier nourricier* (QN) à Montréal.

Méthodes : Une analyse secondaire d'un sous-ensemble des données originales du programme de recherche *Valeur de l'action intersectorielle locale* a été effectuée. Les données qualitatives sont issues d'une collecte de données prospective ayant suivi l'évolution du système d'action complexe QN entre mars et novembre 2014. Les traces observables de l'action ont été relevées dans des notes d'observation, des documents et des entretiens téléphoniques, puis codifiées dans une matrice chronologique d'évènements critiques et une matrice ordonnée par rôle. L'analyse inductive des matrices a identifié les éléments significatifs pour expliquer le déroulement de l'action.

Résultats : Trois opérations interdépendantes et concomitantes affectent à la fois la relation entre les partenaires et la conception du projet : (a) l'idéation sous contraintes, (b) la négociation de priorités, et (c) la représentation politique. Chaque opération présente un ensemble de pratiques qui font progresser l'action intersectorielle locale.

Conclusion : Mettre en lumière les pratiques du terrain, en les ancrant dans trois opérations nécessaires pour effectuer des transformations dans les environnements locaux favorables à la santé, permet de guider la planification des stratégies et la conduite des actions pour mener des partenariats intersectoriels.

Mots clés : Action communautaire, action intersectorielle locale, collaboration/partenariats, conception, développement des capacités (y compris les compétences), environnements favorables à la santé, étude de cas, promotion de la santé, réalisme critique, urbanisme/santé urbaine/milieu urbain

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(Ce manuscrit a été soumis le 17 mars 2022. Après évaluation par des pairs, il a été accepté pour publication le 6 octobre 2023.)

Global Health Promotion 1757-9759; Vol 31(4): 102–111; 1211229 DOI: 10.1177/17579759231211229 journals.sagepub.com/home/ghp

Introduction

L'action intersectorielle locale est souvent mise de l'avant comme innovation pour agir sur les environnements favorables à la santé, un pilier de la promotion de la et de l'équité en santé (1). À l'échelle locale, en particulier, la qualité et la distribution des ressources telles que le logement, les services publics ou le capital social ont un impact direct sur les inégalités de santé (1). Pour la santé publique, cela implique que les leviers permettant d'agir sur les déterminants sociaux, structuraux et environnementaux de la santé se situent à l'extérieur du champ d'action du système de soins (2) : les professionnels doivent donc être outillés pour la conduite de l'action intersectorielle locale. Cependant, les connaissances disponibles sur les pratiques menées par les partenariats intersectoriels dans l'atteinte de leurs objectifs sont plutôt parcellaires, laissant les professionnels face à une « boîte noire » avec laquelle il demeure difficile de composer pour planifier les partenariats de manière optimale et en maximiser les bénéfices sur les milieux locaux (3). Cet article vise à offrir une analyse empirique des pratiques de l'action intersectorielle locale.

L'action intersectorielle, alternativement nommée action concertée ou partenariat collaboratif, est définie comme une approche « impliquant la collaboration entre plus d'un secteur gouvernemental, dont le résultat visé, implicitement ou explicitement, est l'amélioration de situations complexes d'équité en santé, et qui vise à prévenir les inégalités de santé avant qu'elles ne deviennent cliniquement identifiables – non simplement en augmentant l'accès aux soins de santé » (4). Par extension, on appelle aussi action intersectorielle un partenariat entre divers ordres d'acteurs dans l'espace public, que sont les corporations privées, les institutions (incluant les gouvernements) et les associations ou organismes communautaires (2). Le principe d'intersectorialité consiste à « faire converger vers la santé des points de vue, des disciplines, des secteurs publics ou privés distincts et séparés » (5), en particulier ces secteurs qui contribuent à façonner les déterminants sociaux de la santé. Ainsi, cette approche comprend une grande diversité d'interventions visant une variété de problématiques, de déterminants et de populations, ainsi qu'une large gamme de niveaux d'intégration entre les partenaires et de formalité dans les structures adoptées (4,6).

La littérature nous informe quant aux finalités, aux structures et aux acteurs participants à l'action intersectorielle locale, ainsi qu'aux conditions qui la facilitent ou l'entravent (6,7). Cependant, les mécanismes et processus critiques pour son efficacité sont mal connus (3,4,7). Les pratiques, activités ou stratégies utilisées par les partenariats intersectoriels dans la poursuite de leurs objectifs – ce qu'ils *font* et *comment* – sont peu documentées (1,3). Il est pourtant essentiel de documenter empiriquement les pratiques de l'action intersectorielle locale et leurs contextes afin de mieux planifier et conduire l'action, car « comme pour toute stratégie d'action, un partenariat se pense, se construit, s'analyse, s'outille et s'évalue pour être efficace » (3). C'est dans cette perspective que s'inscrivent les recherches sur l'action intersectorielle locale menées à ce jour par l'équipe de la Chaire de recherche du Canada *Approches communautaires et inégalités de santé* (CACIS) (1).

En réponse à cette lacune, la présente étude a pour objectif de suivre et d'expliquer le déroulement du processus de conception d'une initiative intersectorielle locale. Au moyen de l'étude du cas de la démarche *Quartier nourricier (QN)* menée en 2014 à Montréal (quartier Centre-Sud), elle vise plus spécifiquement à identifier quelles sont les opérations qui ponctuent ce processus et les pratiques qui font progresser l'action intersectorielle locale.

Méthodologie

Contexte et historique de la démarche QN

Le cas à l'étude débute suite à l'annonce d'un financement de 416,000 $ (alloué sur quatre ans à partir de 2014) pour le programme Revitalisation urbaine intégrée (RUI) de la Ville de Montréal. Ce programme vise à soutenir des démarches participatives communautaires pour lutter contre la pauvreté et améliorer la qualité de vie dans les quartiers défavorisés. La Ville de Montréal invite alors les membres d'une structure de concertation intersectorielle existante, formée en 2013, à soumettre un projet. Le cas suit le processus de conception de la soumission mené par ce groupe composé de 11 organisations communautaires, privées, parapubliques et institutionnelles, avec la concertation de cinq conseillers ou élus municipaux, pour un total de 31 personnes impliquées. Un long historique de concertation et de nombreuses

initiatives contemporaines au cas à l'étude rendent complexes les relations entre ces acteurs, dont les domaines d'expertise et d'action varient : environnement, sécurité alimentaire et urbaine, culture, engagement citoyen, développement économique, réinsertion professionnelle, aménagement, santé, et politique municipale.

Le cas est restreint au processus de conception du projet : ses limites temporelles vont du 5 mars 2014, moment où la possibilité de financement est présentée au comité pour la première fois, jusqu'au 20 novembre 2014, où le concept du projet est stabilisé. Au final, le concept retenu – nommé *Quartier nourricier* – est une serre communautaire et la bonification des installations d'un marché local saisonnier sur le terrain de l'édicule de la station de métro au cœur du quartier, un projet structurant pour la sécurité alimentaire et le verdissement du quartier.

Cette étude de cas vise à expliquer comment l'action intersectorielle a mené à l'élaboration de l'itération finale du concept *QN*. Le cas à l'étude a fait l'objet d'un échantillonnage non-probabiliste par choix raisonnés : la démarche *QN* a été sélectionnée comme étant un *cas typique* d'action intersectorielle locale puisqu'elle a ultimement mené à l'ajout de ressources locales favorables à la santé (8).

Collecte de données

La collecte de données s'est effectuée dans le cadre du programme de recherche *Valeur de l'action intersectorielle locale* (1). Ce programme a obtenu une approbation éthique du Comité d'éthique de la recherche en santé (CÉRES) de l'Université de Montréal (#14-117 CERES-D) et du comité d'éthique de la recherche de la Direction régionale de santé publique de Montréal (#288).

En s'appuyant sur la théorie de l'acteur réseau (TAR), la complexité et le réalisme critique (9), l'intervention y est conceptualisée comme un réseau sociotechnique d'actants humains et non humains dotés d'agentivité qui interagissent avec leur contexte. De ces fondements théoriques découle la nécessité pour les chercheurs de concentrer leur collecte de données prospective sur le processus de changement en cours et les évènements observables de son déroulement. Cela demande un large éventail de données qui permettent l'étude approfondie du processus, ainsi qu'une proximité entre l'équipe de recherche et les participants. Afin de tenir compte de l'adaptabilité et des boucles de rétroaction qui caractérisent les systèmes complexes, les données sont initialement collectées de manière exploratoire et ouverte (9). Un accent particulier est mis sur la création et l'évolution du réseau et de son contexte afin de documenter les événements significatifs qui les transforment (9).

Le sous-ensemble de données primaires utilisé pour la présente étude inclut :

1. Notes d'observation de **neuf (9) rencontres** (46 pages), tenues du 5 mars 2014 au 16 janvier 2015 (ci-après : 'observations') ;
2. **Quinze (15) documents** (43 pages) : communications écrites, procès-verbaux officiels, infolettres et rapports ou documents (ci-après : 'procès-verbal' (PV), 'courriel' ou 'infolettre') ;
3. Notes de **huit (8) entretiens téléphoniques** ('entretien', 43 pages), du 6 mars au 23 octobre 2014, entre l'agente de recherche et une interlocutrice principale de l'organisme de soutien au développement local pilotant le partenariat, la Corporation de développement communautaire Centre-Sud, qui ont pour but de compléter la compréhension des enjeux et les évènements observés sur le terrain.

Les notes de terrain et des entretiens téléphoniques ont été prises par les agentes de recherche : celles-ci ne représentent donc pas un verbatim du discours des participants, mais bien une interprétation des éléments jugés importants à capter. Les citations ci-bas sont tirées intégralement des données primaires utilisées pour cette analyse.

L'analyse secondaire de données est limitée par l'absence de possibilité de retour aux participants et d'ajustements en cours de collecte, qui caractérisent généralement la recherche prospective. Cependant, les données recueillies ont été présentées par les chercheures de l'étude primaire à trois participants issus de l'organisation qui pilotait le partenariat, ce qui a permis de vérifier la justesse de la chronologie des évènements captée par les données prospectives. Par ailleurs, la consultation fréquente par les chercheures du présent article des agentes de recherche de l'étude primaire contribue à la validation des résultats (10).

Analyse secondaire des données qualitatives

Une analyse de contenu dirigée a retracé le déroulement de l'action à l'aide de deux matrices. La *matrice d'évènements* a servi à identifier chronologiquement les *évènements critiques* ayant ponctué le processus (11), soit ceux « qui modifient ou renforcent la trajectoire d'une intervention » (12). Suivant les caractéristiques proposées par Figueiro *et al*. (12), chaque évènement critique relevé est décrit à l'aide des catégories analytiques suivantes : acteurs humains et non humains, actions, interactions, conséquences, contexte ; ainsi que d'une vignette descriptive narrative. La seconde matrice est la *matrice ordonnée par rôle* qui permet de recenser les acteurs impliqués dans le cas par leur nom, leur organisation, leur mission, leurs intérêts, et leur présence aux évènements critiques. Une *codification structurelle* correspondant aux catégories analytiques ci-haut a été appliquée aux données afin de faire émerger le contenu des matrices (11).

Dans un deuxième temps, l'*agrégation catégorielle* a été utilisée pour expliquer le déroulement de l'action, en faisant émerger les éléments explicatifs importants et en les regroupant ('*clustering*') afin de les lier à des phénomènes sous-jacents aux faits rapportés (13). Une première codification inductive des matrices a fait émerger les raisons ou motivations qui expliquent les actions ayant infléchi le cours de l'action. Une deuxième étape a consisté à examiner la nature et les relations entre les codes émergents pour les agréger dans des *thèmes* (11). Suivant la méthode de *focalisation progressive* (13), ces thèmes ont été progressivement définis et clarifiés par des retours itératifs entre les données et les codes afin de préciser les matrices initiales.

Ainsi, la distinction principale entre l'analyse primaire et secondaire de ces données se situe dans l'approche analytique : alors que le programme de recherche initial utilisait une approche abductive basée sur un cadre théorique, l'analyse secondaire présentée ici a été entièrement inductive.

Résultats

L'analyse du cas fait émerger trois **opérations** interdépendantes et concomitantes qui guident les décisions et actions des partenaires. La collaboration intersectorielle a mené au concept ultime de *QN* en suivant des opérations relatives à : (a) l'idéation sous contraintes, (b) la négociation de priorités, et (c) la représentation politique. Chaque opération comporte un certain nombre de *pratiques clés* (8 en tout) favorables au déroulement de l'opération, résumées dans le Tableau 1.

A. L'idéation sous contraintes

La conception de la démarche *QN* consiste au premier chef à développer un projet qui réponde aux objectifs du programme de financement. Cependant, ce processus est marqué par la découverte graduelle d'un nombre croissant de contraintes limitant les projets possibles. Quinze exigences parfois contradictoires des instances décisionnelles balisent l'octroi du financement : notamment, le concept retenu doit « faire sa marque avec un grand projet » (observations 2014-03-05), mais l'enveloppe ne

Tableau 1. Sommaire des opérations et pratiques de conception de l'action intersectorielle locale dans le cadre de la démarche *Quartier Nourricier*.

OPÉRATIONS	*PRATIQUES*
(a) Idéation sous contraintes	1. Participer à des sessions de remue-méninge 2. Mobiliser de nouvelles ressources ou de nouveaux partenaires
(b) Négociation de priorités	
a. Rapport de conciliation	3. Adopter un leadership rassembleur
b. Rapport de compétition	4. Argumenter pour son propre domaine d'intervention 5. Contribuer proactivement au développement du projet
(c) Représentation politique	6. Coordonner les actions des partenaires et des instances gouvernementales 7. Mobiliser des champions dans l'appareil municipal 8. Mettre de l'avant des arguments économiques

peut être allouée ni à des aménagements permanents, ni à des salaires ; et être à la fois pérenne et avoir des retombées dès la fin de l'année en cours.

La démarche de conception elle-même est réalisée dans l'urgence en raison d'échéances de soumission extrêmement serrées, ce qui empêche le recours à des stratégies de planification comme les études de viabilité ou les consultations publiques : « On est en état d'urgence depuis sept[embre] 2013, ça fait 14 mois ! » (observations 2014-11-20). À cela s'ajoutent les normes municipales de design, de construction et d'occupation des terrains, ainsi que les nombreux autres projets d'aménagement urbain prévus dans l'arrondissement, parmi lesquels le concept sélectionné devra s'imbriquer.

Chaque nouvelle contrainte à laquelle les partenaires sont confrontés les force à retourner à la planche à dessin pour modifier le concept. Les pratiques employées pour les surmonter consistent, d'une part, à participer à une série de *« session[s] de remue-méninge »* (courriel 2014-03-05) où les acteurs impliqués lancent des idées afin de trouver une solution. De mars à novembre 2014 ont lieu six rencontres en comité élargi, ainsi que des sessions de travail en sous-groupes entrecoupées d'un travail de rédaction. D'autre part, *mobiliser de nouvelles ressources ou de nouveaux partenaires* permet d'élargir le champ des possibles : « Ce n'est rien 416,000 $. Ce sera un projet de 2 millions ! Si tu prends en considération l'argent que l'arrondissement va devoir mettre (eau, électricité), on va aller chercher de l'argent de [l'organisme de soutien au développement], [et l'organisme du domaine culturel] va donner de son temps. Les organismes aussi » (entretien 2014-04-11). En conséquence, au cours de la concertation, quatre itérations du projet ont été élaborées et soumises pour approbation.

Ainsi, l'**opération d'idéation sous contraintes** consiste en un va-et-vient menant à une série d'itérations du concept de projet. Les acteurs intersectoriels tentent ainsi par plusieurs moyens de concevoir un projet qui répond à la fois aux attentes et contraintes du programme de financement et aux besoins du milieu.

B. La négociation des priorités

En concomitance avec l'opération d'idéation, l'élaboration du projet implique de déterminer les objectifs visés et les retombées attendues à partir d'une liste de huit priorités pour le milieu, issue d'une démarche antérieure. Pour y parvenir, les acteurs tentent au premier abord de mettre de côté leurs intérêts propres afin de proposer un concept consensuel qui réponde avant tout aux besoins du milieu et combine un maximum de priorités à la fois: « il faut que [chacun mette] de côté sa priorité prioritaire et tente de voir qu'est-ce qui pourrait être fait et qui aiderait par la bande son projet » (observations 2014-03-05). Ainsi, les partenaires sont initialement dans un **rapport positif de conciliation**. Par contre, ils sont finalement contraints de prioriser parmi les huit objectifs préalablement identifiés afin de préciser le concept. La nature hétérogène de l'action intersectorielle locale faisant en sorte que les partenaires ont généralement des missions différentes, cela les place dès lors dans un **rapport de compétition**. En résulte une **opération de négociation des priorités** qui a duré tout au long du processus de conception.

Cette tension entre les rapports de conciliation et de compétition est entretenue par les pratiques des partenaires intersectoriels. D'un côté, le porteur de projet entretient la conciliation en *adoptant un leadership rassembleur* qui permet non seulement de coordonner la mise en commun du travail, mais surtout de maintenir des liens positifs entre les acteurs grâce à des communications en coulisses : « on a réussi à mettre les gens ensemble, à créer un climat de confiance entre les organismes » (entretien 2014-07-02). À l'inverse, pour imposer leurs intérêts et obtenir leur part de l'enveloppe, les acteurs abandonnent leur posture conciliante et *argumentent pour leur propre domaine d'intervention* comme besoin prioritaire : « il manque toujours de financement à [mon organisation], cela pourrait permettre de produire des végétaux pour verdir plusieurs espaces » (observations 2014-04-24) ; « je vais prêcher pour ma paroisse [. . .], pour le culturel, c'est là que ça doit aller » (observations 2014-06-19). Les acteurs qui réussissent à tirer leur épingle du jeu dans cette négociation sont ceux qui *contribuent proactivement au développement du projet*, soit en offrant leur expertise, leur influence auprès des instances décisionnelles, ou par leur engagement fréquent dans le travail de rédaction.

C. La représentation politique

Puisque l'obtention du financement est conditionnelle à l'approbation du projet par

plusieurs instances municipales, les partenaires établissent diverses stratégies pour favoriser l'alignement de leur proposition avec les intérêts des décideurs. Les acteurs sont conscients qu'il est « essentiel » que « les élus soient informés en amont et qu'ils soient parties prenantes de ce projet pour qu'il puisse se réaliser » (PV 2014-04-24). La réalisation du projet dépend par exemple de la volonté politique d'entreprendre des démarches légales pour accéder à un terrain. Par l'**opération de représentation auprès des acteurs décisionnels**, les partenaires cherchent à influencer les élus et à défendre les mérites des concepts soumis : « on va travailler avec les fonctionnaires. . . pour influencer l'affaire. Mais faut contrôler le discours un peu : c'est de la représentation politique » (entretien 2014-03-06).

La première pratique de représentation politique consiste à *coordonner les actions des partenaires et des instances gouvernementales*. En plus de présentations en conseil d'arrondissement et de communications régulières, cinq rencontres ont été tenues avec les représentants municipaux entre mars et novembre 2014. Ces rapprochements permettent une « meilleure coordination : se concerter sur les différents plans d'action que chacun a, et définir comment mieux travailler ensemble, arrimer [l'élue] » (entretien 2014-10-23). La seconde stratégie consiste à *mobiliser des champions dans l'appareil municipal* : ces individus portent et défendent le projet au sein des divers départements responsables de l'allocation du financement. Ceux-ci guident les partenaires dans l'élaboration du projet en les aiguillant sur la réception potentielle des décideurs. Troisièmement, les partenaires modifient le concept du projet afin de *mettre de l'avant des arguments économiques*, notamment la création d'emplois et la rentabilité, qui sont des priorités pour les instances décisionnelles : « On va présenter certaines choses différemment pour s'assurer que ça passe. [. . .] on va parler votre langage. [. . .] oui, on va faire de l'animation culturelle, pratiques vertes, etc. faut pas que ce soit au cœur de l'argumentation. On fait ça parce que ça va avoir un impact sur l'économie du quartier » (entretien 2014-06-02).

L'opération de représentation auprès des acteurs décisionnels aura eu pour effet de modifier la forme que prendra le projet final, et permettra également d'obtenir un soutien essentiel à la réalisation de la démarche *QN*.

Interactions et interdépendance entre les opérations

Ces trois opérations sont conçues comme concomitantes et interdépendantes pour expliquer le déroulement du processus d'action intersectorielle locale dans la démarche *QN*. Leurs interactions peuvent être mises en lumière dans l'exemple du volet culturel du projet. Initialement incluse dans la première itération via une programmation culturelle et la présence d'artistes [**opération** : négociation (rapport de conciliation)], la priorité culturelle a été graduellement écartée du projet. Une rencontre avec un interlocuteur municipal qui encourage les partenaires à bonifier les éléments économiques [**opération** : représentation politique] est suivie par le constat que le financement ne peut pas payer des salaires d'artistes [**opération** : idéation sous contraintes]. En réaction, l'intervenante en culture « se fâche un peu puisque la culture passe toujours en dernier dans les propos [du porteur de projet]. » (observation 2014-06-19). L'organisme culturel diffuse ensuite une critique de la démarche et tente de faire pression pour que la culture remonte dans l'ordre des priorités du projet [**opération** : négociation (rapport de compétition)]. « Jusqu'à présent, la culture est quasi inexistante dans les projets présentés. Malgré que nous soyons présents sur le comité RUI-QI, il y a très peu d'oreilles autour de la table pour des projets culturels » (infolettre diffusée le 2014-07-29 ; QI : *Quartier intégré*, démarche de planification antérieure ayant ciblé les priorités dans lesquelles s'inscrit la démarche *QN*). Cependant, parce que les partenaires déplorent l'absence de contribution concrète du secteur culturel, leur réception n'a pas été favorable aux revendications [**opération** : négociation (rapport de compétition)]. Le financement a été finalement octroyé à des installations de réfrigération et une serre dans l'itération définitive du projet.

Discussion

L'étude de cas met en lumière trois opérations qui permettent à la fois de suivre le déroulement et d'expliquer la conception d'une action intersectorielle locale. La démarche *QN* se définit par le développement d'une solution innovante, balisé par des contraintes à plusieurs niveaux, marqué par une dynamique qui met en tension la conciliation des

intérêts des partenaires avec un rapport de compétition, et qui répond à des impératifs politiques qu'ils tentent d'influencer en leur faveur. Se déroulant simultanément et en interdépendance, ces trois opérations affectent à la fois la conception des multiples itérations du projet et la relation entre les partenaires.

Les trois opérations sont ici spécifiques à une démarche de conception dans un contexte d'urgence, où il n'y avait pas d'alignement préalable autour d'un projet tangible. Dans cette démarche, la réussite de chacune des trois opérations est nécessaire pour mener à une transformation du milieu local : sans idéation, les partenaires et les décideurs peuvent être mobilisés autour d'objectifs communs sans solution concrète à mettre en œuvre ; l'échec de l'opération de négociation mènerait à l'approbation d'un projet qui n'est pas intersectoriel ; et l'absence de soutien des acteurs décisionnels empêcherait le projet intersectoriel d'aller de l'avant.

La contribution principale de cet article consiste à appliquer empiriquement une conceptualisation théorique de la *conception*, comme aspect de la *planification*, afin de faire émerger les opérations et pratiques (ce que les acteurs font) qui la constituent. Comme la littérature n'atteint pas de consensus sur la conceptualisation des composantes des programmes en promotion de la santé, notre travail contribue à ouvrir cette boîte noire et à offrir des définitions de ces concepts. Les travaux de notre équipe conçoivent l'action intersectorielle locale comme un système interventionnel dans un système complexe, modélisé par un réseau sociotechnique interagissant avec son contexte par des processus continus et dynamiques (9). Les quatre processus interventionnels – la *planification*, la *mise en œuvre*, l'*évaluation* et la *pérennisation* – sont ainsi définis comme des processus simultanés, non pas comme phases circonscrites dans le temps (14). Ces processus concomitants permettent à l'intervention d'avoir des effets, soit des transformations du milieu par l'ajout de ressources promotrices de santé.

De cette conception dynamique de l'action intersectorielle locale, il devient possible de concevoir des opérations qui se construisent au cours du déroulement de l'action, et qui permettent l'identification de pratiques spécifiques à chacune. Cette étude de cas identifie deux aspects de la *planification* – la *problématisation* et la *conception* – ainsi que trois opérations distinctes de la conception qui permettent de cerner huit pratiques. La *planification* de la démarche *QN* avait déjà commencé avec l'identification préalable de huit priorités du milieu, dans un exercice de *problématisation* antérieur aux balises du cas à l'étude, et se poursuit après la conclusion de la collecte de données. Les relations entre ces processus interventionnels, les opérations et les pratiques liées sont schématisées dans la Figure 1.

De cette définition théorique découle la notion que les trois opérations identifiées sont continues et contemporaines des autres processus interventionnels, plutôt que limitées à un moment dans le déroulement de l'intervention. Il est donc possible de s'attendre à ce que l'idéation, la négociation et la représentation soient pertinentes à toutes les étapes du projet et se poursuivent jusqu'à la transformation ultime de l'environnement bâti. Cette conceptualisation des processus interventionnels implique qu'il y aurait donc des opérations supplémentaires, également simultanées et interdépendantes, qui relèvent de la *problématisation*, de la *mise en œuvre*, de l'*évaluation* et de la *pérennisation*. Il est souhaitable que des recherches futures étendent l'étude des opérations de l'action intersectorielle locale à tous les processus des systèmes interventionnels, afin de comparer et compléter les pratiques qui en émergent.

Non seulement ces résultats sont-ils cohérents avec les modèles existants de l'action intersectorielle locale, mais ils permettent d'apporter des précisions aux processus théoriques identifiés préalablement et donc d'en renforcer la pertinence :

Les trois opérations identifiées complémentent les trois fonctions des réseaux collaboratifs du modèle de Bilodeau *et al.* (1). Celui-ci identifie les jalons observables qui marquent « le processus par lequel l'intervention opère et produit ses effets » (1), et regroupe ces résultats transitoires (RT) en trois fonctions : (i) la construction continue des réseaux et leur gouvernance ; (ii) les représentations et l'influence ; et (iii) la convergence des acteurs et des ressources nécessaires à l'action (15). Les similitudes entre les trois fonctions, basées sur la théorie de l'acteur-réseau, et les opérations observées empiriquement renforcent et valident ces connaissances. Les opérations concomitantes représentent des processus transversaux aux trois groupes de RT, qui permettent l'avancement de l'action entre chaque jalon et qui peuvent mener à

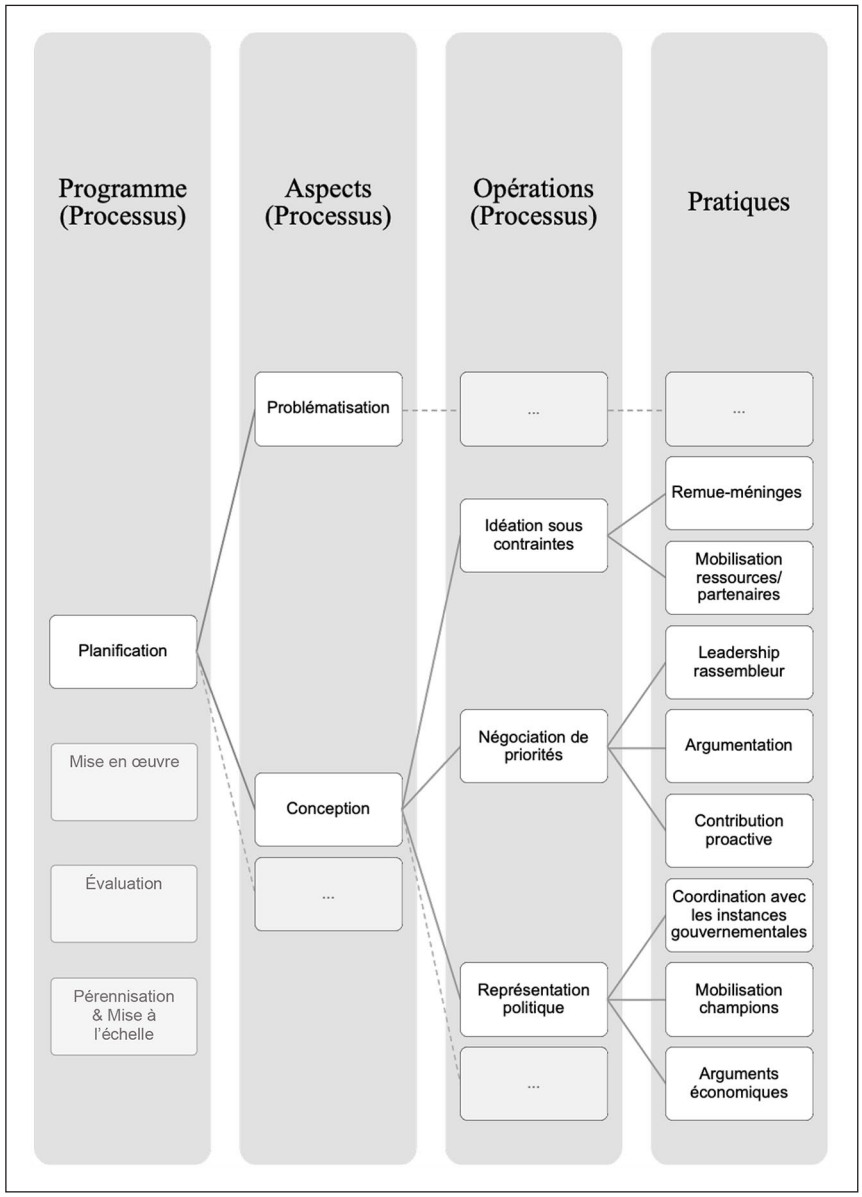

Figure 1. Schéma sommaire des processus programmatiques de l'action intersectorielle locale, théorisés dans le cadre de la démarche *Quartier nourricier*.

des RT dans les trois fonctions. Ces résultats soulignent l'adéquation entre les pratiques nécessaires pour la progression de l'action et les types de jalons que celles-ci permettent d'atteindre.

Ensuite, dans le modèle Bergen du fonctionnement collaboratif (7), le processus de *maintien* inclut les activités qui favorisent la régulation et le fonctionnement du partenariat, ce à quoi correspond l'opération de négociation. La *production* faisant référence aux activités qui avancent la mission du partenariat (7,16), cela englobe les opérations d'idéation et de représentation. Les résultats de la

présente étude s'appuient sur ces processus en identifiant des pratiques utilisées pour maintenir les partenariats et produire des effets en lien avec leurs objectifs.

Néanmoins, les limites méthodologiques de l'étude de cas font en sorte que certaines notions relevées dans la littérature pour expliquer le déroulement de l'action intersectorielle locale ne peuvent être observées.

D'une part, les données documentaires représentent les traces formelles du partenariat, soit ses éléments observables, plutôt que les perceptions subjectives des participants comme leurs motivations ou leur ouverture à l'intersectorialité. L'analyse secondaire est également limitée à la captation écrite réalisée lors de la recherche primaire, laissant de côté les interactions en coulisses et les dynamiques informelles, en particulier les relations personnelles et les structures de pouvoir (17), Ces interactions constituent des *structures profondes* opaques, « difficiles à apprécier parce qu'elles ne sont pas formalisées dans le discours officiel et la documentation écrite » (17), mais qui pourraient expliquer le déroulement et l'issue du partenariat.

D'autre part, l'étude des systèmes complexes que sont les partenariats demande de circonscrire l'objet d'étude alors que les relations entre les acteurs et leur contexte s'étendent bien au-delà de l'unique démarche *QN*. Il est donc possible que certains facteurs déterminants pour son déroulement se soient situés hors de la portée de l'étude, comme les collaborations antérieures ou des projets simultanés.

La transférabilité des résultats obtenus à d'autres partenariats intersectoriels peut également être limitée par deux facteurs. D'abord, l'analyse secondaire des données n'a permis qu'une validation partielle des résultats : la validation de cette étude de cas s'appuie sur une vérification des données primaires effectuée par l'équipe de recherche originale, alors que les résultats de l'analyse secondaire n'ont pas fait l'objet de retour aux participants. La validité de ces résultats s'appuie sur un cadre théorique solide issu de la littérature. Ensuite, la diversité fonctionnelle et structurelle entre les partenaires et le niveau d'intégration de la collaboration peuvent également exercer une influence sur sa pérennité et sa réussite (18). Ces caractéristiques peuvent présenter différents types d'obstacles, qui nécessitent des pratiques adaptées. Des recherches futures permettront de valider la transférabilité des résultats à d'autres contextes et à des partenariats qui diffèrent de la démarche *QN*.

Conclusion

Il est nécessaire de mettre en valeur les pratiques des partenariats intersectoriels afin de savoir *ce qu'ils font* et *comment* ils arrivent à leurs fins. La présente étude contribue à l'identification de ces meilleures pratiques en mettant en lumière, de façon empirique et inductive, trois opérations qui concourent à la conception d'une action intersectorielle locale : l'idéation sous contraintes, la négociation de priorités, et la représentation politique. Chacune présente un ensemble de pratiques par lesquelles les partenaires présents ont fait progresser la démarche *QN* et entretenu l'intersectorialité de la collaboration.

Aussi, la présente étude offre une contribution théorique critique pour l'action intersectorielle locale par la conceptualisation des opérations sous forme de processus continus et concomitants. L'étude répond au besoin de documentation empirique des partenariats intersectoriels et met en lumière des pratiques observables sur le terrain. Ces résultats participent ainsi à mieux comprendre et structurer les pratiques qui mènent à des transformations favorables à la santé. En effet, par son grand potentiel d'action sur les milieux de vie et les déterminants sociaux de la santé, ainsi que sa capacité à donner une voix aux groupes marginalisés et à combiner les types de savoirs, l'action intersectorielle locale contribue à l'équité en santé (2).

Remerciements

Les autrices remercient leurs partenaires de recherche au niveau des communautés locales pour leur généreuse contribution. Les auteurs souhaitent également reconnaître la contribution de Chantal Lefebvre et Marilène Galarneau, professionnelles de recherche au Centre de recherche Léa-Roback sur les inégalités sociales de santé de Montréal, qui ont réalisé la collecte initiale des données dans le cadre du programme de recherche Valeur de l'action intersectorielle locale (Phase 1).

Conflit d'intérêt

Aucun conflit d'intérêt déclaré.

Financement

Cette recherche a été financée par l'Institut de la santé publique et des populations des Instituts de recherche en

santé du Canada–Subvention programmatique 2011-2016 (IRSC ROH115211). Louise Potvin est titulaire de la Chaire de recherche du Canada Approches communautaires et inégalités de santé (CIHR 950-232541).

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