

Advancing patient-centered care: moving from outcome-based to risk factor-based models using the big four risk factors

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ABSTRACT

This article reimagines the health care system to focus on risk factors rather than outcomes in order to improve patient-centered care and reduce health care expenditure. Patient-centered care has been a global priority since 2001 when the Institute of Medicine declared it an essential aim for health care systems. As part of this discussion and to help facilitate this change, the concept of the big four risk factors – diet and nutrition; physical activity; smoking and tobacco use; and excessive alcohol consumption – is introduced in the context of the Americas from which it originates. Using peer-reviewed literature, health policy guidelines, theories, frameworks, and transdisciplinary implementation science strategies, this article explains how public health research and medical centers are set up in terms of disease, or outcome, rather than risk factor, or exposure. It suggests how moving from outcome-based health care models to focus on prevention using the big four risk factors will lead to better patient-centered care and health outcomes. Transdisciplinary research and complexity science, a framework largely developed and tested in Latin America, are recommended to facilitate this change and develop multicomponent, multistakeholder action and cooperation. Future research should pilot the proposed changes at various health-system levels and in different settings and report on the outcomes of implementation to assess effectiveness and improve translation of research, perhaps using the standardized RE-AIM (Reach, Effectiveness, Adoption, Implementation, Maintenance) evaluation framework.

Keywords

Patient-centered care; disease prevention; health promotion; health care delivery; public health.

The Institute of Medicine declared that patient-centered care (PCC) was one of the six essential aims of a health care system in 2001. Since then, there has been rich discussion in the literature about what PCC entails, including in Latin America (1). Aimed at improving both individual and population health outcomes, PCC has been difficult to achieve, in part, because the operational definition is continually changing (2). At its core, the literature affirms that PCC is a quality of personal, professional, and organizational relationships (2). It is well documented that achieving this level of quality will likely demand infrastructural changes, such as increased accessibility, systems for care coordination, quality care metrics, and organization (2).

In fact, similar to other forms of value-based health care that can be traced back to World Health Organization (WHO) recommendations from the 1970s, it demands a fundamental shift in the way health care systems operate, professionals practice, and patients engage (3).

While, for decades, the literature affirmed that PCC employs a holistic understanding and enhances disease prevention and health promotion (4), there has been confusion about what PCC means, and many of the implemented changes – gadgetry aiding patient navigation, electronic health records, and improved scheduling technologies – do not, on their own, achieve PCC (2).

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In Latin America, access to and the quality of health care services vary, but recent research has demonstrated how PCC, while unevenly implemented, leads to better health outcomes (1). Therefore, now is the time to identify strategies to overcome challenges to the implementation of PCC which encourages a holistic view of the patient, engages patients as active members of their care plan, and enhances disease prevention and health promotion. Prioritizing PCC may improve access to and the quality of health care in Latin America, while also indirectly addressing other issues such as inequality.

EVALUATING THE CURRENT MODEL

In contemporary medicine and public health, both research and clinical centers are set up to address disease, or outcome, rather than risk factor, or exposure. Providers specialize in tertiary treatments of very specific diseases, and research is focused on identifying the specific mechanism of action or most efficacious treatment for that disease. National institutes of health, ministries of health, training programs for medical providers, and funding streams are set up in the same way. In other words, current health care systems are incentivized to be reactive to sick patients rather than proactively support healthy people and the maintenance of healthy behaviors (5). Moreover, providers often lack the time and skills to be effective at primary prevention, and patients may benefit from more interactive and culturally aligned support outside the clinical setting (6). Therefore, as public health professionals, we have an ethical obligation to ask, “Is this outcomes-based approach best?”

The literature affirms that prevention has many advantages over a cure, and the only way to reduce current disease burdens is by prioritizing primary and secondary prevention strategies. Yet in the status quo, reactive procedures to manage existing illnesses are well compensated, while public health systems focused on prevention and population health are underfunded and understaffed (5). For example, such phenomena can be seen when looking at provider compensation for lung transplants as compared to smoking cessation counseling or for performing bariatric surgery as compared to providing additional nutritional counseling.

CHANGING THE MODEL TO ADDRESS THE BIG FOUR HOLISTICALLY

According to WHO, cardiovascular disease and cancer are leading causes of death around the world (7, 8), a trend mirrored across the Americas in countries such as the United States (9), Colombia (10) and Argentina (10). It is true that each disease and category of diseases has a unique etiology, causal framework, and clinical presentation. It is also true that the biggest causes of death include the so-called big four risk factors in their causal pathways: diet and nutrition; physical activity; smoking and tobacco use; and excessive alcohol consumption (11, 12). Cardiovascular disease and cancer are umbrella terms that include many specific diseases: heart attacks, heart failure, and hypertension; breast cancer, colorectal cancer, and lung cancer, respectively. Fatty liver disease, type 2 diabetes, and many other diseases are also the result of the big four risk factors. Briefly: diet and nutrition refer to the availability and intake of healthy foods and the relationship an individual has with food; physical activity refers to any bodily movement produced

by skeletal muscles that requires energy expenditure; smoking and tobacco use refer to the use of tobacco in any form; and excessive alcohol consumption refers to drinking more than pre-specified, responsible, and healthy thresholds established by medical experts.

In fact, the literature shows that the most common risk factors for one noncommunicable disease are also risk factors for other noncommunicable diseases, and it therefore supports a reform in health care that prioritizes the need to tackle noncommunicable risk factors through improved and concentrated disease prevention efforts (13). Significantly, noncommunicable diseases and their risk factors account for more than 71% of early deaths in the United States (14), and, as evidenced by the current coronavirus disease 2019 (COVID-19) pandemic, are significant risk factors for more acute cases of and deaths from communicable diseases as well.

As a life course epidemiologist that studies multilevel risk factors for noncommunicable diseases and health outcomes, these same four risk factors keep reappearing in peer-reviewed literature as shared risk factors for noncommunicable diseases. Moreover, while studying the Colombian Ministry of Health, I noticed that their noncommunicable disease office was divided into three teams – pediatrics, cancer, and cardiovascular disease – which were all addressing the same four risk factors in a siloed manner. These observations support the need to move from outcome-based to risk factor-based models using the big four risk factors.

Importantly, these four risk factors are all significant and modifiable risk factors. While there may be other more immediate or predictive factors (e.g., genetics or screening procedures) available, they likely are more expensive, require more specialized training, facilities, and attention, and may not be modifiable. In other words, the big four risk factors are relatively low cost, modifiable, and universal risk factors that can be addressed in diverse settings and populations.

Therefore, what would it look like to move from the current outcomes-based models for research and treatment? What would it look like to set up a patient-centered system focused on primary prevention and eliminating risk factors, rather than tertiary treatment or disease treatment? Why might it make sense to build a health system focused on treating risk factors such as the big four, rather than their associated outcomes? What challenges may arise?

Let’s not be naïve, these epistemic, or conceptual, and administrative changes would not be easy to implement. Pharmaceutical and biomedical research companies that make billions from outcomes-based care would need to reinvent business models, and both their profits and, by extension, global economies, may falter. Industry giants in the alcohol, tobacco, and food industries will use significant resources to combat primary prevention of the big four risk factors as it is a direct threat to their market shares. In addition, while millions of preventable diseases and deaths would be avoided, people will continue to have other health complications and issues that will require treatment.

With a health system built around risk factors, incentives would change for individuals, institutions, and nations. Individuals would be empowered and expected to make lifestyle changes rather than depend so heavily on reactive care, including medication. Aligned with the chronic care model, providers will make the medical diagnosis in a clinical setting

and will connect patients with evidenced-based and personalized interventions that take place outside the clinical setting. Health care systems may have improved care coordination and transdisciplinary health services delivery, as referrals would be based on the patient's lifestyle. Medical associations could avoid discussions about changing the body mass index guidelines and percentiles to reflect a higher-weight society because obesity would cease to be the pandemic that it is today (15). Countries would invest more in vaccination programs and community exercise facilities, as has already been piloted in countries such as Brazil (16). Overall, the general health of the population would improve with improved quality of life for patients and more productive economies (15). In another words, person-centered health care approaches would advance many domains (3).

To be clear, tertiary care will still be an essential part of PCC. Tertiary care is inevitable and necessary, and there is an ethical and professional obligation to provide these services as well. Conditions such as Fabry disease will require tertiary care which we are obligated to provide and to continue to research and develop improved treatment protocols. Even with a concerted effort to address the big four risk factors, heart disease will continue, at least for the next few generations, as genetic and other environmental risk factors will continue to be present. Using Rothman's terminology, the big four are "sufficient" but not "necessary" (17): the big four are often important players in the constellation of risk factors for many noncommunicable diseases such as heart disease and cancers, but they are *not required* for the disease to develop. Moreover, as evidenced by the recent COVID-19 pandemic, they can be important risk factors in communicable diseases as well. Undoubtedly, tertiary care and advancements in tertiary care for today's biggest health threats will continue to be required.

Yet, we have become too reliant on tertiary care in the status quo (18). We have built a system with increasing costs that are economically disastrous (19). It is time to question if the disproportionate investment in tertiary care is best for individual patients and population health (20). Primary prevention is not just cheaper: targeting the big four with transdisciplinary collaboration has downstream effects that improve the quality of life for everyone. Eliminating the big four makes the world safer and healthier, and now is the time to shift the focus and prioritize primary prevention.

COMPLEXITY SCIENCE: THEORETICAL FRAMEWORK TO GUIDE NEXT STEPS

Complexity science, a framework that largely has been developed in Latin America and used by Latin American government and academic actors, affirms that disease systems and associated changes are not linear and demonstrates how the health-disease situations of individuals and communities are emerging phenomena. Therefore, complexity science supports moving from outcome-based to risk factor-based models using the big four risk factors, as it emphasizes the importance of assessing and addressing peripheral and upstream risk factors that lead to the formulation of health actions through transdisciplinary collaboration. Complexity science affirms the findings from epidemiological causal theory and identifies the big four as sufficient but not necessary risk factors (17).

Complexity science offers a roadmap to modify the health system to focus on risk factors rather than outcomes. In a culturally sensitive manner, complexity science not only affirms the need to address the big four, but also to do so in a sustainable way that reimagines a new more effective health care system. It offers an implementation process to be enacted in four phases.

The first phase in achieving true and sustained transformations in the health system and the health status of individuals and communities is to conduct a needs assessment of the target population – both individuals and communities. Then, the findings need to be harmonized with local, national, and international guidelines and best practices for these health issues.

Second, health teams must characterize the existing network to optimize a seamless implementation and community acceptance and adherence, ultimately, maximizing improved health outcomes. To do so, the health team will, in accordance with network analysis methodologies, identify the: a) self-organization processes; b) nodes; c) links; and d) the hub (highly connected node) (21).

Third, through mapping the network and in partnership with community stakeholders, the health team implements the evidence-informed interventions. Importantly, any interventions will focus on enacting small changes gradually to ensure that changes will be sustained.

Fourth, the final part includes the ongoing evaluation and modification of the implemented solutions through ongoing community stakeholder engagement.

Importantly, complexity science is an emerging and new field that is based on many evidenced-based theories and tools. Community-based participatory research, transdisciplinary collaboration, and standardized evaluation frameworks, such as the RE-AIM (Reach, Effectiveness, Adoption, Implementation, Maintenance) framework, ensure that moving to a risk factor-based model using the big four risk factors is both responsive to the articulated issue, the local context, in dialogue with the literature, and evaluated in a standardized and rigorous manner.

MOVING FROM THE PATIENT TO THE PERSON

Currently, PCC activities are predominantly aimed at the clinical health care practice, which limits the scope of any intervention. This phenomenon makes sense, as the etymology of the term patient, the person receiving medical attention, comes from the Latin for "to suffer". In other words, the hermeneutics, or word choice, matches the treatment approach. Yet, from expert committee recommendations to empirical studies, effective interventions focus on primary prevention, or helping people and communities engage in healthy behaviors. In other words, both the health care system and the poetics, or terminology, used to describe the current system neither follow best practices nor support optimal patient outcomes.

Comprehensively and sustainably providing PCC requires collaboration with different fields and populations. Transdisciplinary collaboration and engaging community stakeholders overcome field-specific barriers, and this allows for more responsive and innovative approaches, reduces the significant lag in translation, and improves health outcomes. Consequently, health policy, especially policy that mobilizes resources, must

be built through transdisciplinary approaches, understood in the most inclusive manner, and address upstream social determinants of health holistically rather than more immediate downstream concerns such as reactive treatment. Health policy must also promote PCC through enhanced disease prevention and health promotion (4). Operationally, these two terms have the following aims.

- Health promotion aims to address the determinants of health to reduce inequalities and improve the overall health of the collective. Health promotion interventions vary in scope and include strategies aimed at people who are low risk up to high risk and individuals to groups.
- Disease prevention aims to reduce risk factors and increase protective factors related to the different events of interest. The objective is to reduce the incidence, prevalence, and recurrence of health conditions, and the time in which people remain with symptoms or at risk of developing them.

Both of these activities demand transdisciplinary collaboration and more attention, a change that can be facilitated through modifying the health care system using complexity science's multistep process.

CONCLUSION

PCC has been unevenly implemented and not fully achieved. Reimagining the health care system with a focus on risk factors rather than outcomes may be the evidence-informed infrastructural change needed to improve PCC. In other words, when evaluating population health and individual health outcomes, a new vision, organization, and/or patient-care model may be the necessary solution to elevate the quality of care: more

specialized tertiary care equipment and training may not lead to the biggest return on investment. Reimagining health care to enhance disease prevention and health promotion rather than encourage passive, expensive, and reactive care will not only improve health outcomes, but also reduce health care expenditure. Addressing the big four risk factors – diet and nutrition; physical activity; smoking and tobacco use; and excessive alcohol consumption – may provide the biggest return on investment.

Yet implementing such changes will not be easy. Complexity science, paired with transdisciplinary research approaches, offers an evidence-informed way forward. Disease prevention and health promotion will require scalable, multicomponent, multistakeholder action and cooperation. Future research should pilot the proposed changes at various levels and in different settings to assess effectiveness and external validity.

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Promover la atención centrada en el paciente: pasar de modelos basados en los resultados a modelos basados en los factores de riesgo empleando los cuatro grandes factores de riesgo

RESUMEN

En este artículo se plantea un cambio en el sistema de atención de salud para que esté centrado no en los resultados sino en los factores de riesgo y así mejorar la atención centrada en el paciente y reducir el gasto en atención de salud. La atención centrada en el paciente ha sido una prioridad mundial desde el año 2001, cuando el Instituto de Medicina (IOM, por su sigla en inglés) la declaró un objetivo básico de los sistemas de atención de salud. En el marco de este debate y para ayudar a facilitar este cambio, se introduce el concepto de los cuatro grandes factores de riesgo (régimen alimentario y nutrición, actividad física, tabaquismo y consumo de tabaco, y consumo excesivo de alcohol) en el contexto de la Región de las Américas donde se origina. Empleando bibliografía publicada en revistas arbitradas, directrices de políticas de salud, teorías, marcos y estrategias científicas de aplicación transdisciplinaria, en este artículo se explica cómo se configuran la investigación de salud pública y los centros médicos en términos de enfermedad (o resultado) en lugar de factor de riesgo (o exposición). Se indica que al pasar de modelos de atención de salud basados en los resultados a modelos centrados en la prevención que usen los cuatro grandes factores de riesgo supondrá una mejora de la atención centrada en el paciente y de los resultados de salud. Se recomiendan la investigación transdisciplinaria y la ciencia de la complejidad, un marco creado y puesto a prueba en gran medida en América Latina, para facilitar este cambio y lograr medidas y cooperación con múltiples componentes y partes interesadas. La investigación que se haga en el futuro debería poner a prueba los cambios propuestos en varios niveles del sistema de salud y en diferentes entornos, y presentar información sobre los resultados de la implementación para evaluar la efectividad y mejorar la traducción de la investigación, tal vez utilizando el marco estandarizado de evaluación RE-AIM (sigla en inglés de cobertura, eficacia, adopción, implementación y mantenimiento).

Palabras clave

Atención dirigida al paciente; prevención de enfermedades; promoción de la salud; prestación de atención de salud; salud pública.

Como avançar na atenção centrada no paciente: transição de modelos baseados em desfechos para modelos baseados em fatores de risco utilizando os quatro grandes fatores de risco

RESUMO

Este artigo reimagina o sistema de saúde para se concentrar nos fatores de risco e não nos desfechos, a fim de melhorar a atenção centrada no paciente e reduzir os gastos com a saúde. A atenção centrada no paciente tem sido uma prioridade global desde 2001, quando o *Institute of Medicine* dos EUA a declarou um objetivo essencial para os sistemas de saúde. Como parte dessa discussão e para ajudar a facilitar essa mudança, o conceito dos quatro grandes fatores de risco – dieta e nutrição, atividade física, tabagismo e uso de tabaco, e consumo excessivo de álcool – é introduzido no contexto das Américas, de onde ele se origina. Com base na literatura revisada por pares, diretrizes de políticas de saúde, teorias, estruturas e estratégias científicas de implementação transdisciplinar, este artigo explica como a pesquisa sobre saúde pública e os centros médicos são criados em função de doenças – ou desfechos –, em vez de fatores de risco – ou exposições. Sugere-se como a transição de modelos de saúde baseados em desfechos para um foco na prevenção, utilizando os quatro grandes fatores de risco, levará a uma melhor atenção centrada no paciente e a melhores desfechos de saúde. Recomenda-se o uso de pesquisa transdisciplinar e da ciência da complexidade – uma estrutura amplamente desenvolvida e testada na América Latina – para facilitar essa mudança e desenvolver ações e cooperação entre vários componentes e partes interessadas. Pesquisas futuras devem testar as mudanças propostas em vários níveis do sistema de saúde e em diferentes ambientes e informar sobre os resultados da implementação para avaliar a eficácia e melhorar a tradução da pesquisa, talvez utilizando a estrutura padronizada de avaliação RE-AIM (do inglês *Reach, Effectiveness, Adoption, Implementation, Maintenance*; em português, Alcance, Eficácia/Efetividade, Adoção, Implementação, Manutenção).

Palavras-chave

Assistência centrada no paciente; prevenção de doenças; promoção da saúde; assistência à saúde; saúde pública.
