integrated care team that provides primary care, behavioral health, health coaching, physical therapy, chiropractors, and acupuncture, as well as a pharmacy and fitness center at a central wellness center, all at no cost to members. Moreover, all 5 clinics are certified as Patient-Centered Medical Homes (PCMH) and provide integrated population-health tools like quality improvement dashboards, care coordination and clinical pharmacist support.

These clinics also include a full range of wraparound service providers including licensed clinical social workers, board-certified hospital chaplains, nurse navigators to triage patients and explain benefit policies, and telehealth services with on-call nurse practitioners, all without any out-of-pocket cost to the employee. Providing this large network of support ensures the whole person is being cared for, both inside and outside clinic walls.

The results: For health plan members attached to clinic primary care providers vs members attached to community-based primary care:

- Overall medical costs are nearly 30% less.
- Inpatient admissions are 38% less.
- Emergency room utilization is 23% less.

Conclusion

Metro Nashville Public School's five-pronged approach to promoting health equity amongst its population has produced impressive results. The district has seen increases in the diagnosis and treatment of behavioral health conditions, greater engagement in lifestyle and other anti-obesity interventions, and improved health and lower overall cardio-metabolic trend.

More importantly, promoting health equity for teacher populations can have a ripple effect in the community. Having a benefits package that supports their whole health can increase retention, decrease absenteeism, increase productivity, and improve mental and emotional outlook. This, in turn, results in positive classroom environments and outcomes. Furthermore, the economic effects for teachers and the district have downstream effects on communities and businesses as spending is shifted away from health care and into the community.

With health care costs expected to continue to rise, employers will need to look for ways to contain costs and support employees and their families. Metro Nashville Public School's approach can serve as an example for other employers striving to address health inequities, achieve economic goals, and support the health and well-being of employees.

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The Importance of Human-centered Design in Equitable Health Promotion Initiatives

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Introduction

Human-centered design (HCD) is an iterative approach that focuses on engaging end-users to understand their needs, behaviors, and preferences to create products, services, or systems that are effective, efficient, and enjoyable. It prioritizes understanding, empathy and engagement with the people who will ultimately use or interact with the designed solution to genuinely meet their needs. With ongoing

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end-user involvement throughout the entire offering development cycle, the HCD approach is crucial in creating products and services that are intuitive, user-friendly, and meaningful. As a result, these HCD-derived offerings may be more efficacious and impactful in real-world settings than those developed using other approaches.

Since 1958, when John Arnold of the Stanford University Design School suggested that engineering design should be human-centered,[1] adoption of HCD principles has spread to an increasingly diverse array of business and community initiatives, as well as organizational culture.[2] More recently, use of HCD in healthcare service design has been expanded to facilitate identification and mitigation of factors contributing to health inequities.[3] However, with rare exception,[4] adoption of HCD in the well-being industry has been slow. The objective of this commentary is to provide an overview of HCD principles and processes and describe its application and potential value in health promotion program development (Figure 1).

Foundational Principles of HCD

While there is no consensus regarding the specific elements that comprise HCD, there are key principles and components that underlie the approach. At the core of HCD is ongoing, iterative engagement of a specific population subgroup (real-world users) through all phases of problem-solving design work. This is common to several methods engaging participatory design principles. A foundational tenet of HCD is empathy, which allows for a deep understanding of the perspectives and experiences of the users. Insights gained from observations, user focus groups, interviews, and data analysis can help to identify unmet needs, existing barriers and personal priorities and social context in relation to a particular topic.

Once the particular problem and desired outcome have been identified, the design process can leverage the user group and others to creatively brainstorm and test potential solutions to address unmet user needs. A range of viable alternatives may be identified, with the goal of refining the available options based on user feedback to ensure that real-world needs and priorities are being addressed effectively. Iterative enhancements to the proposed offering can then be made to optimally align access and functionality with user group priorities. Finally, once the offering has been operationalized, user input can also be incorporated into ongoing evaluation to ensure continued alignment with user needs. Simply defined, HCD is a product- or service-based problem-solving approach that incorporates the perspectives of affected individuals throughout the problem-solving process. Their involvement includes initially observing the problem within context to understand human needs, followed by brainstorming, conceptualizing, developing and implementing a solution.[5]

Expansion of HCD into Healthcare

Prior to 2018, HCD in healthcare had included both clinician-and patient-focused initiatives, addressing an array of care delivery considerations.[6] Since that time, interest in HCD application to healthcare has grown substantially,[7] impacted by numerous factors, including COVID-related clinician burnout, greater awareness of health inequities, and perhaps most importantly, the rapid growth of digital health solutions. As a result of methodologic challenges with evaluation of HCD in healthcare,[8] researchers have proposed an expanded framework for HCD application that combines HCD principles with evidence-based health services research.[9] In many cases, the HCD principles become a component of larger quality improvement initiatives, and data collected from employees become a key input to larger process models, including Define, Measure, Analyze, Improve, and Control (DMAIC), a tool associated with Lean 6 Sigma. Similar perspectives on HCD in healthcare include quality improvement projects, which work to design-out errors and to maintain consistent processes. Other perspectives include participatory action research, where individuals contribute to the development of research questions, data collection tools, and sometimes data analysis. What makes HCD unique from some of these other initiatives is its focus on user co-development of solutions. Another setting where HCD has been applied is in the realm of digital health, where there is an ongoing shift from a techno-centric to a more patient-centric focus.[10]

Application of HCD in Health Promotion

In health promotion, the use and potential value of HCD has been seemingly slower to materialize. For example, in a 2022 review of HCD use in the development of weight loss interventions, Eliott, et al[11] identified just 9 studies. Six involved development of a mobile health application, patient-clinician communication tools were

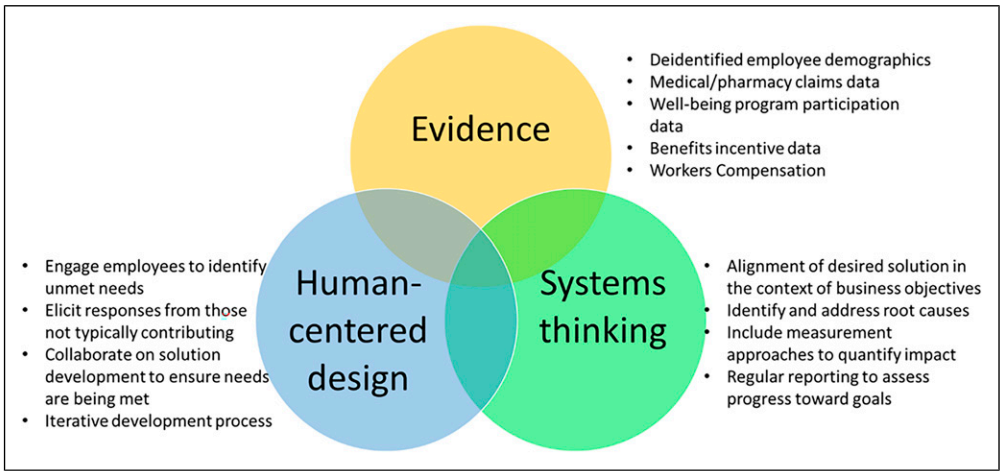

Figure 1. Human-centered design as a complement to an evidence- and systems-based solutions development approach.

described in 2 studies, and a single study detailed HCD use in development of, respectively, an mHealth device, an eHealth solution, and a health promotion program. In a September, 2023, presidential advisory from the American Heart Association, Volpp et al[12] called for a new research initiative that incorporates HCD to enhance patient engagement and behavior change in relation to healthy dietary habits. The authors acknowledge that incorporation of HCD in the development of behavior change strategies can enhance overall effectiveness.

There appears to be increasing interest in the use of HCD in health promotion. Chen, et al[13] describe their experience utilizing HCD methods to enhance development of food skills among caregivers of young children eligible for federal food assistance while in retail food settings. Caregivers, grocery store staff, and government program staff were successfully engaged in an HCD approach to co-create 2 potential interventions based on caregiver experiences and needs. The authors provide details of their case study including insights regarding the use of HCD methodology. Additionally, in a 2022 review, Vial et al [14] characterized the use of HCD in digital mental health program development, identifying 22 of 30 studies meeting inclusion criteria that incorporated elements of HCD to varying degrees. These recent publications portend broader marketplace application of HCD principles in healthcare, and health promotion program design and implementation, in particular.

From a historical perspective, the "traditional" health promotion vendor model involved use of subject matter experts to develop programs and services that were marketed to employers, with the use of incentives to drive utilization. Participation was generally lower among individuals in demographic minorities, including low-wage workers and racial/ethnic subgroups,[15,16] resulting in the potential for health promotion programs to worsen health inequities.[17] With greater recognition of the extent of health inequities – and the need to include health equity as part of employer diversity, equity and inclusion initiatives, integration of HCD into program development offers the promise of more equitable program offerings.

Even when organizations try to offer more tailored health promotion programs to their employees, those programs are more effective when organizations pair them with initiatives aimed at the worksite, beyond just the individual. For instance, researchers demonstrated how a smoking cessation program became more effective when the organization developed a parallel initiative to address employees' exposure to harmful pollutants in the work environment.[18]

Similar objectives exist in the relationship between patients and clinicians as between employees and their employer, in that both benefit from a trusting relationship and collaborative efforts at operationalizing a shared goal. Human-centered design can facilitate greater awareness by both clinicians and employers of the respective needs of patients and employees. The common goal is engagement – of patients to achieve greater adherence to evidence-based care recommendations,[19] and of employees to improve well-being and enhance more favorable business outcomes.[20] In both cases, transitioning from a clinician or employer-centered service delivery approach to a more truly patient/employee-centered one can engage employees more meaningfully as active participants in their health and in their work setting.

Potential Role of HCD in Health Promotion Program Planning

The potential applications of HCD in health promotion span the spectrum from program development to implementation. Human-centered design can be used in program design to engage employees whose perspectives and needs may not be included in the existing development process. For example, while subject matter experts may meaningfully contribute to the objectives and content of a health promotion program, their perspectives may not address the unique needs of specific population subgroups, including individuals from racial, ethnic, or other demographic minorities, workers with heavy job demands, or low-wage workers. Insights may include identification of previously unappreciated participation barriers, such as time limitations for hourly workers,[21] job demands, transportation, or a lack of culturally appropriate content or representation among the offerings.

Human-centered design can also be used to inform more effective communication efforts to engage under-represented subpopulations. For example, existing internal marketing channels, such as company e-newsletters, may easily be accessed by office workers, but the work responsibilities of front-line personnel in retail, manufacturing or healthcare may limit their ability to view relevant content, especially if computer access is limited. Additionally, HCD can be used to develop materials that are readable by individuals with low literacy or translated into other languages to foster employee inclusion and attract greater employee interest and participation.

Finally, while, delivery of more relevant offerings will likely trigger greater employee participation, incentive design considerations may well represent another opportunity to incorporate HCD, with the goal of further augmenting and sustaining ongoing participation rates. Outcomes-based incentives illustrate a problematic example of how the absence of HCD in program planning could worsen health inequities. Low-wage workers, often overrepresented by individuals in minoritized racial and ethnic groups, have a higher disease prevalence and unhealthy lifestyle risk burden. As a result, they may face greater challenges in achieving the desired biometric outcomes, leading some to consider outcomes-based incentives as discriminatory.[22] Similarly, incentives that could disappear through non-participation or incomplete reporting may deter low-wage employees from participating in the first place, leading employees to select suboptimal programs that offer more perceived certainty or security. It is also worth noting that tracking outcomes, such as steps walked, is itself burdensome and challenging, especially given limited access to computers, as noted above.

Value Proposition for Inclusion of HCD in Health Promotion

As previously described, the value of HCD is generated by engaging with stakeholders to elicit their perspectives and, with those in mind, collaborating to improve health promotion solutions. The goal is to develop solutions that will enhance employee participation in health promotion programs, but also to address barriers more generally in the external or worksite environments. By eliminating barriers to health, employers should benefit by enhancing workforce health and well-being. Specific sources of value include:

- Greater employee engagement in programs due to closer alignment of programs with perceived participant needs[18]
- Enhanced program impact as a result of greater participation
- Anticipated reduction in health inequities as a broader range of employees seek program engagement
- Spill-over effects beyond specific programs due to a system-level focus on improving employee health and well-being

- Potential reduction in the need for incentives to drive participation
- Enhanced employee engagement with work, along with associated reductions in turnover[20]
- Favorable impact on business outcomes due to more highly engaged employees[20]

Potential Barriers and Concerns Regarding Use of HCD in Health Promotion

Currently, barriers exist in relation to broader adoption of HCD in health promotion, but they are not insurmountable. Perhaps most important is the fact that as a construct, examples of use of HCD in this setting are largely anecdotal. Employers have become inured to health promotion participation rates in the 40%–60% range, and as a result, there has been little impetus to alter traditional approaches to program development to expand participation rates. It is also worth noting that the same barriers that inhibit participation in health promotion programs likely also prevent people from engaging in HCD opportunities. Engaging individuals, particularly those from demographic subgroups traditionally underrepresented in health promotion planning, is likely to require some effort and an organizational commitment to HCD principles. In some cases, employers might be tempted to pass responsibility for nonparticipation onto their employees—the program is there if they want to use it. Until the extent of health inequities in current health promotion program participation and outcomes can be measured and lack of potential end-user input is identified as a contributing factor, systematic incorporation of HCD into program development efforts is unlikely to progress.

Another potential challenge for HCD is its effect on innovation. Some critics of the method fear that users may not know exactly what they want or need and may not be aware of the possibilities available to them. We mentioned before that the traditional model of benefits design included subject-matter experts who could develop programs that were disseminated to employees. There is no need to eliminate subject-matter experts from benefits design. However, more effort is needed to obtain feedback about proposed health promotion programs from end-users and to validate their feasibility and effectiveness for all employees, including those who do not normally participate. In addition, given the diverse needs of employees, an organization's portfolio of health promotion program offerings may need to be similarly diverse and flexible, to address the needs of all employees.

However, there is evidence of change. Employee resource groups are an increasingly utilized source for worker perspectives, providing stakeholder input into a growing array of employer-relevant topics, including well-being programs and benefit design.[23] At the same time, vendor interest in addressing the unmet well-being needs of under-represented groups has increased, and some vendors describe use of HCD in their product development processes.[24] Both employers and health promotion vendors can – and perhaps should incorporate HCD use to optimally align well-being offerings with unmet employee needs and priorities. This could have spillover benefits as well, encouraging employee input more broadly to inform strategic planning and enhance organizational operations.

While there are costs associated with incorporating HCD into health promotion programming, we are confident that the enhanced offerings have the potential to demonstrate value by increasing employee participation rates as well as enhancing employee satisfaction, engagement and retention. Employer recognition of the business value of these initiatives can further facilitate their adoption. Thoughtful use of measurement approaches to evaluate HCD-related program development outcomes can help to objectively demonstrate program impact from a business perspective.

Even more broadly, the act of simply engaging employees in strategic planning can yield employer value. By doing so, employees – especially those in traditionally underrepresented groups - receive recognition regarding the importance of their perspectives, which can foster greater employee satisfaction and work engagement.[25] The Gallup organization has demonstrated a myriad of ways that employee engagement benefits employers, from enhanced retention to improved profitability.[20]

Combining HCD and Systems-Based Thinking

Finally, the broader context in which HCD is utilized is of critical importance. If the HCD goal is to develop a more user-friendly solution, there is a risk of overlooking the foundational causes of the issue or investing effort in developing a solution that is only marginally impactful. Without a broader or systems-based perspective, the potential value of HCD may not be fully realized.[26]

For example, the developer of a well-being offering may be so focused on design to meet potential user needs that measurement approaches to quantify the offering's impact – and value – to potential employer or vendor purchasers may be overlooked. Similarly, a narrowly focused digital solution might be developed to meet end-user needs, but insufficient attention is given to how that solution could be integrated into the established product marketplace. These scenarios highlight the importance – and business value – of integrating a systems-based approach with HCD to optimize the value and impact of design efforts, as shown in Figure 1.

Conclusion

When thoughtfully incorporated, use of HCD along with a systems-based approach to development and implementation can enhance stakeholder well-being program effectiveness and value. Opportunities exist for stakeholders, including employers, vendors, and researchers, to formally incorporate these processes into solution development efforts. By so doing, the needs of potential participants will be more meaningfully addressed. With a growing national focus on reducing health inequities, now is the time to elicit input from traditionally under-represented subpopulations to develop more equitable health promotion programming to encourage greater participation. Inclusion of a systems-based approach can help to ensure program delivery creates measurable value for all stakeholders.

The emphasis on HCD signals a necessary shift in organizational thinking away from one-time employee surveys asking for single pieces of information about existing benefits packages towards systems that integrate employee feedback throughout all levels of the organization and all phases of co-development. Health promotion represents a useful setting for HCD, because of the emphasis on human-centered outcomes for employees and family members. However, just as these outcomes require commitment from across the organization, the methods for achieving HCD similarly require a data-driven, system-wide understanding of the needs facing employees and their input into solutions to address those needs.

Author Contributions

BWS: Concept and design, drafting of the manuscript. ES: Obtaining funding, drafting of the manuscript, critical revision for content. RG: Drafting of the manuscript, critical revision for content. PLP: Obtaining funding, drafting of the manuscript, critical revision for content.

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