

The Role of Social Networks in Health Behavior Change

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ABSTRACT

Social networks play a crucial role in shaping health behaviors by influencing individual decisions through peer interactions, social norms, and community structures. This paper examines how social connections impact health choices, the mechanisms driving behavior change, and the theoretical frameworks explaining these influences. Concepts such as homophily, social capital, and contagion effects help explain how health behaviors spread within networks. The study also discusses the effectiveness of network-based interventions, including community-driven initiatives and online social networks, in promoting positive health outcomes. Ethical considerations and future research opportunities are also examined to highlight the potential of leveraging social networks for public health advancements.

Keywords: Social networks, health behavior change, peer influence, social norms, social capital, health interventions, social contagion.

INTRODUCTION

In recent years, scholars have increasingly focused on how social connections impact individual health decisions and behaviors. Initial research examined the influence of social relations—like support from family and friends or advice from coworkers on health behavior and medical choices. However, with the rise of social media and advanced network methods, discussions have broadened to include how health behaviors spread within social networks and the relationship between network properties and health outcomes. This emerging literature provides public health professionals with opportunities to utilize social network structures for improved health promotion and disease prevention interventions. Key themes include social capital, social support theory, and social network theory, which suggest that health information often spreads through network links, brokers connect disparate social groups, and opening closed triads fosters diffusion. The paradigms of "health behavior is contagious" and "community social norms shape individual behavior" are examined in this context. Evidence shows that risk factors like smoking and obesity, along with conditions like depression, can spread through friendship networks, with contagion effects extending beyond immediate connections. Individuals are more inclined to change behaviors when many peers do so. Community social norms clarify how network influences operate. The influence process can be described as a two-stage mechanism that amplifies behavior locally, leading to broader adoption through network connections. Related inquiries reveal that influential people often have ties to other influential individuals, that mutual friendships have a more significant impact than one-sided ties, and that specific network configurations can enhance agreement on controversial health topics [1, 2].

Theoretical Frameworks for Understanding Social Networks and Health Behavior Change

Researchers have not yet fully developed the theoretical framework linking network position to health behavior changes, although processes for the spread of normative behaviors and attitude changes have been established, albeit within single disciplines. Two key theories connect network position to behavior adoption or rejection: the first is homophily, or social influence, which suggests that individuals' behaviors and attitudes align with those of their associates over time through internalization. However, various

interpretations have emerged across disciplines. The second theory posits that the network environment influences health through access to information, resources, and support mechanisms, highlighting a structural or contextual effect. Concepts like network capital and social capital clarify the diverse access channels and individual outcomes linked to network position, promoting network-based bounded rationality that enhances decision-making compared to traditional models of individual choice. Despite the distinct research traditions focused on health outcomes and networks, efforts have been made to understand these processes and their respective impacts on significant health behaviors. There is a proposal for a potential merger of these concepts to better elucidate the connection between social ties and individual choices [3, 4].

The Impact of Social Networks on Health Behavior Change

In an ideal world, social networks provide their members with the necessary support to address the various health challenges of everyday life. This would include fostering an atmosphere that rewards exercise, relaxation, and sensible eating while condemning smoking, drug use, and dangerous sexual behaviour. Social connections and friendships provide an emotional safety net that one can turn to when one finds oneself in any kind of personal crisis. However, there are very few social settings where such beneficial relationships are the dominant form of connection. In contrast, health-related peer effects are largely negative and the benefits of shared health information are only enjoyed by a select few, lucky individuals. Thus, when people form ties, much of what passes from one person to the other is not beneficial, whether in terms of health information and behaviour related to the spread of diseases or noxious health behaviour. There are competing mechanisms leading to conformity in health-related behavior, some involve copying from the popular, the successful, or the majority and others take the form of reacting against difference or variety. Quite early on in the formation of a network a particular behaviour may spontaneously become a social custom of the group once it reaches a critical number of socially influential members. Once a norm is established it has a non-zero persistence; old customs die hard. Different groups may have different norms for the same behaviour or health issue. Within the group, an individual may decide to conform to one norm on a particular issue and the opposite on another. To sum up, in forming a network, whether by design or by chance, individual health behaviour and its treatment may become the subject of wider social interaction and the social norms to which a person conforms may well change over time as they start to reflect those of the networks in which they are emersed and with whom their ties are strongest and most intense [5, 6].

Peer Influence and Social Support

This paper explores the roles of peer influence and social support in changing health behaviors. Individuals are motivated by their peers' behavior and attitudes within social networks, which can establish self-similar habits, such as body weight. Positive peer support can enhance the likelihood of adopting health-related behaviors like a better diet, while negative peer attitudes can lead to unhealthy eating and increased BMI. Social support can bolster a person's confidence in their decisions but can also manifest as opposition to certain behaviors. For instance, unhealthy choices, like poor eating and drinking, may be mocked by friends, complicating engagement in such behaviors. The duality of social networks plays a crucial role in shaping health outcomes, illustrated by the "small-world" property of networks. The ripple effect model posits that peers influence behavior adoption through mechanisms such as modeling, reinforcement, and normative influence. Modeling occurs when an observer replicates a behavior demonstrated by another. Social reinforcement refers to how others' reactions to actions can either promote or discourage those actions. Normative influence explains conformity to social network behaviors due to social pressure. Health decisions are influenced by cognitive and interpersonal mechanisms, whereby one's social context significantly impacts motivation to engage in closer relationships. Denser networks facilitate the spread of positive health behaviors, as close friends and family are generally more supportive and can foster lasting change through shared behaviors. The insights from previous findings, expert commentary, and theoretical models highlight the role of social networks in shaping health outcomes and the limitations of simplistic models that fail to account for the influence of friends and companions on these outcomes [7, 8].

Social Norms and Conformity

Social norms greatly influence an individual's health choices. A social norm is a shared standard that shapes behaviors among individuals, who tend to follow the norms established within their social networks. Regardless of the health outcome, social norms promote mimicry of behaviors. Four key factors predict health-related behaviors based on the perceptions and expectations of one's social network. Norms

related to behavior arise through interaction and are reinforced by shared expectations within the group. Individuals are more likely to engage in behaviors if they believe others in their network do the same, leading to conformity. This phenomenon occurs when individuals adjust their actions to align with others, driven by the desire for common status or to satisfy psychological needs. Conflicting claims can challenge social norms, yet individuals often feel a strong inclination toward conformity. The varied nature of social networks can both aid and complicate health promotion efforts. Understanding social pressure is essential in recognizing its impact on individual choices and agency. Recommendations include integrating healthier reproductive norms while avoiding harmful ones in maternal health interventions [9,10].

The Use of Social Network Analysis in Studying Health Behavior Change

According to the World Health Organization, health encompasses mental and physical well-being, not just the absence of disease. Health behaviors are influenced by social environments, making it essential to consider these dynamics when addressing health outcomes. Social network analysis (SNA) effectively captures the complexities of social ties and their impact on health, allowing for measurements of social capital and contagion often overlooked in conventional research. By analyzing network structures and dynamics, researchers can pinpoint influential individuals and observe how link density affects network functionality. As social relationships shape health behavior, people may adopt poor habits or healthier practices based on peer influence and shared health concerns. Acknowledging these connections, various studies focus on how social ties affect health behaviors. SNA can help elucidate these influences and support public health by addressing complex social relationships inadequately described by traditional methods. Further research is needed to examine social ties and health outcomes better. Despite limited public health studies utilizing SNA to analyze social relationship formation, understanding social influencers and information diffusion mechanisms presents opportunities for health interventions. This study aims to explore the potential applications of SNA in health research and inform broader public health strategies. It is essential to articulate how to utilize SNA as an innovative research method to deepen insight into health behavior changes, improve understanding of social determinants affecting these changes, and instigate effective interventions [11,12].

Interventions Utilizing Social Networks for Health Behavior Change

Research into effective interventions for health behavior change remains limited. Developing interventions rooted in people's social networks offers an opportunity to address these gaps. Various interventions have been tested at different levels, utilizing social networks to influence health behavior. Two types of interventions targeting social networks are identified: those aimed at individual-level relationships and those that engage broader groups, such as school classes or communities. A specific focus is on peer influence effects, exploring how social networks impact individuals' behaviors through modeling, reinforcement, information sharing, setting norms, and promoting change. Integrating this theoretical foundation into treatment protocols is a recent development. This paper examines current research on peer influence effects, especially related to adolescent alcohol and cigarette use, and discusses their incorporation into network-based interventions. It reviews diverse trials of such interventions, presenting findings from individual-level approaches focusing on close relationships, primarily testing HIV prevention and drug use, and later discussing community-level interventions targeting broader population changes. Treatment considerations from both intervention types are explored, along with strategies for creating, refining, and applying network-based interventions across various populations [13,14].

Online Social Networks

In recent years, online social networks have become integral to modern society, serving as key venues for health promotion by conveying health information and forming health communities through user interactions like virtual peer influence. A study from 2008 to 2012 found that these interactions could motivate individuals to adopt healthier behaviors by facilitating information exchange. However, it also highlighted that peer influence could lead to the adoption of riskier health behaviors, indicating potential adverse effects from misinformation. There is a pressing need for trusted information sources. Additionally, interactive applications with social networking capabilities for health promotion have surged. This overview introduces different online platforms and successful health interventions through them. Various platforms enable information sharing and e-forum functions, allowing users to post blogs about obesity or seek answers from health professionals. Others facilitate social interaction and sharing of personal eating and exercise habits. Users can join communities with shared health goals, and several

successful cases have been reported on these platforms, emphasizing the spread of healthy lifestyle information. Participants engage in discussions and ask questions, creating a participatory online experience [15, 16].

Community-Based Interventions

Health behaviors thrive within the contexts of friendships, families, and communities. Interventions that leverage social network structures can effectively change health practices, as behavior change relies on learning and relational adjustments. Hence, network-based interventions should consider timing and localization in treatment. These initiatives engage various agents, including peers, families, and health workers, and function at individual, household, and community levels. It's crucial to design health policies that reflect the interaction between formal health systems and informal networks. Discussions emphasize community network-driven individually focused interventions, urging improved mapping of social networks for more effective health-network interventions across diverse settings. Building capacity in vulnerable communities is essential for addressing their health network needs. Global health efforts must move beyond basic network interventions to adopt a more equitable and ethnographically aware approach. The emergence of social networks has led to tools for assessing peer influence and identifying networks, utilizing data from over 48 million mobile phone users in Kenya. This analysis shows health-conscious individuals are more connected, with calls spreading health messages widely. Programs are evaluated concerning healthy behavior adoption, information diffusion, and network interactions among call center nurses and clients. Ultimately, community-based interventions should prioritize ongoing engagement with community members, apply rigorous mapping of network structures, and recognize the evolving relationship between formal health systems and community resources. These factors are essential for developing health initiatives that harness social networks to promote healthier practices within communities [17, 18].

Challenges and Ethical Considerations in Leveraging Social Networks for Health Behavior Change

New technologies are transforming health behaviors, information-seeking about health, and perceptions of health risks. Online social networks and digital communication have altered how individuals manage health, notably in confronting the global obesity epidemic. The incorporation of health 2.0 tools in public health campaigns is still emerging, necessitating more scholarly research. This text highlights various influencers on obesity health outcomes, showcasing technology's empowering potential. Concerns arise due to privacy issues and the spread of unreliable online health information, causing unease among health professionals about technology's impact on behavior change. Software algorithms monitor and target individuals for health interventions, with risks of misuse affecting social interactions. An ethical framework is needed to guide technology's role in public health while respecting individual autonomy and epidemiological standards. The shift from offline to online relationships has changed influence dynamics, where social influence effects aren't directly applicable to face-to-face settings. A study analyzing awareness of social influence within an online game showed reduced impacts when participants recognized social dynamics. Transparency in interactions correlated with diminished individual performance, signaling caution for online treatment methods. Research exploring a specific social media platform involved various treatment groups for robust findings. Understanding complex influence dynamics requires multi-center trials and comparative studies. Offline interactions differ significantly from the online landscape, fostering new research paths that integrate computer science, epidemiology, and social sciences. An interdisciplinary approach must address network processes, textual content, and socio-cultural contexts, considering ethical implications in utilizing online networks for research. Proper ethical oversight in research designs is essential to minimize risks to participants while ensuring confidentiality. Mutual transparency builds societal trust in online research. Field experimental designs exploring social influence in public health suggest the efficacy of online methodologies. An open-access toolkit for researchers enhances knowledge in this arena, illuminating socially valuable intervention pathways. Significant disparities in ethical practices across settings highlight the need to consider socio-cultural, political, and economic contexts in both online and offline initiatives. Including diverse voices in discussions about ethical health behavior change campaigns is crucial to preventing potential abuse of online platforms [19, 20].

Future Directions and Research Opportunities

After reviewing hotspots and trends in public health using social network approaches, research has expanded from social exchange theory to complex theories, including structural holes, homophily, and social support theory, with developed measurements and methods. Social network data often consists of

survey data, but objective sources like record linkage are also viable. Individuals are embedded in social relationships influencing their attitudes, beliefs, and behaviors, as shown in public health and sociological studies. Consequently, health behaviors are significantly shaped by the social environment, leading many theories to integrate social aspects. Despite recognizing the importance of social networks in public health literature, significant gaps remain. Key empirical questions involve identifying crucial network characteristics in shaping health behavior, effective interventions at the network level, and transferring health strategies to educational systems. Future research could yield insights across public health, sociology, and psychology. Areas of focus include: 1) linking theoretical frameworks to better understand network characteristics influencing health behavior change; 2) collecting observational data from large, longitudinal studies to assess network-targeted interventions and promote interdisciplinary collaboration for new methodologies; 3) employing artificial intelligence and machine learning to analyze how social pandemics impact health behaviors. The application of artificial intelligence in studying social networks and health behavior shows that social networks can alter health behavior through intervention systems, proposing new intervention study approaches. There's a consensus that social network-based health interventions are vital in public health that need clear definitions. Calls for macro-level studies on policy and systems change emphasize the necessity of timely, large-scale social network behavior change interventions to tackle global health threats, urging collaboration among communities, practitioners, and researchers to innovate network interventions in today's rapidly evolving world [21, 22].

CONCLUSION

The influence of social networks on health behavior change is a powerful and multifaceted phenomenon. From peer influence and social norms to online platforms and community-driven interventions, networks shape health decisions at both individual and collective levels. While social networks can promote positive behavior change, they can also reinforce harmful health habits. Effective interventions must strategically leverage network structures to enhance health outcomes, balancing the benefits of social influence with ethical considerations. Future research should integrate interdisciplinary approaches, advanced analytics, and digital technologies to optimize health interventions. By understanding and utilizing social networks, public health professionals can design more effective strategies to improve global health outcomes.

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