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The influence of social networks on the dissemination of health behaviors

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Social network analysis is the process of investigating structures of social relationships in a set called a network. Remember that social networks are different from social media. The latter are digital media that enable collaborative interaction from the creation and sharing of information. Social networks consist of the very interaction between social actors, which can range from *online* social media to actors in *offline* segments.

Studies as in Zhang (2019) demonstrate that social networks can influence health in several ways, from viral diseases or information spreading in society, to the contagion of opinions or behaviors that modify people's traditional habits in daily life.

In the study of Durkheim's suicide (1897), a notion is already presented that the varied ways of relating to one another end up influencing the process of social integration in a certain way. In other words, the idea that individuals are inserted in a network of relationships that range from family connections, neighbors and friends, to organizations and communities they belong to, provides a context of influence over individuals.

Modern network theory started with Moreno (1973) in the elaboration of sociograms used today that graphically represents individuals as Nodes and the relationship between them as Edges. Studies that seek to explore the influence of relationships on an individual's behavior or opinions have been going on for a long time. In this context, zhang (2019) already demonstrates that there can be several ways in which social influence can affect health, such as learning new habits, which can be healthy or destructive.

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One study carried out by McAdam and Paulsen (1993) seeks to specify the relationship between social ties and engagement for change actions. In that, the researchers find that because we are involved in different social relationships, several of the decisions we make end up being influenced at some level by these relationships. In this context, we have the example of the study by Haas and Schaefer (2014), where they indicate that the influence of close people ends up being greater to develop the habit of smoking in exchange for ending this habit, which ends up having less influence.

Bearman and Moody (2004) already demonstrate that there is a direct relationship between the structure of the social interaction network and the individual's subjective well-being. This finding comes from a study they did on the Add Health data set (National Longitudinal Study of Adolescent Health for Adults) in the United States, where they demonstrate that schools with a low relative density of friendship ties tend to have a high number suicide attempts among students.

This type of phenomenon can have implications for example in times of pandemic where students are not exposed to traditional means of social integration in conducting their studies through the *home office* format. That is, the type of social interaction of students in this period undergoes a modification of their interaction bonds.

Studies on suicide conducted by Abrutyn and Mueller (2014) show that individuals who have ties of interaction with people who have had a history of attempted suicide tend to have greater chances of also attempting to commit this act.

However, it is worth noting that this does not mean that because of this finding, people who have already made

such attempts should be avoided, but that not only them specifically, but also those close to them, end up being an important focus group to receive due care. Indeed, Thoits 2011 indicates in his study that the support of social relationships in interactions is directly linked both to an improvement in health and also to a reduction in the mortality rate.

Spreading occurs in different ways between different parts of social networks. Centola (2018) states in his study that things that we would like to spread fail, while others that we would like to avoid spread. Our society consists of multiple social networks that follow structural logic in the dissemination of information. However, the format of this information itself influences the way in which it is propagated.

A traditional study in the area by Granovetter (1983) demonstrates that simple information has a behavior similar to a virus in its spread. For infectious diseases, such as viruses, only a single exposure is required for contagion to occur. That is, even if there is only one infected person on the network, if there is any type of direct contact with the virus, it is already sufficient for its contagion. This happens without anyone having to be convinced to catch the virus.

The same is true of other types of simple information, such as media episodes or banal information such as gossip about famous people. We can know the outcome of an important game or which famous person ended the relationship with only a single access to some social media. Likewise, we may briefly share such information and others will have access to it. In these types of dissemination, elaborate coercion processes are not necessary to make people have access to the information transmitted.

Complex information behaves differently from a virus or media news, they consist of situations that require a certain type of acceptance. For example, the adoption of new health-related behaviors such as wearing masks, there is an initial barrier until greater acceptance occurs. The form of contagion of this type of information is also different, according to Damon Centola (2018), they usually involve some type of cost, whether financial, psychological or reputation.

In situations of complex contagions, more elaborate social factors are needed for the spread to happen. These factors can be understood by their adoption mechanisms. Damon Centola (2018) brings in his study that some of the factors of social mechanism such as legitimacy, credibility, complementarity and emotional contagion need to be satisfied for the process of diffusion of behaviors to occur.

Centola (2018) conducted experiments to identify more effective strategies for intervention through behavioral changes using seeds from these changes in the study population. In it, intervention strategies with the use of seeds were compared both in a random distribution and also in a grouped way in the population. The results indicate that the strategy of conducting this seeding in a grouped manner produced a more effective diffusion in the process of behavioral changes.

Bicchieri (2017) points out that behavioral changes in health depend both on the perception of individuals about the possible risks arising from these changes, as well as on the approval of these behaviors by others, as well as on how widely this behavior is adopted, and finally on the belief that this new behavior has credibility.

Intervention opportunities at different levels of the social structure can become significantly interesting for those who seek to identify and model the impact of social networks on the population's well-being. Zhang (2019) for example suggests that intervention efforts may consider using online means of communication to target health-related information to bring about more effective behavioral changes.

The attitudes of leaders and public persons are fundamental in the context of the dissemination of good practices. Likewise, the non-adoption of these practices, or the adoption of practices contrary to the current recommendations, can cause harmful effects on the population's attitudes.

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