



Peer social network and adolescent alcohol use

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Abstract

Introduction

This review examines the limited, albeit growing research literature related to peer social networks and adolescent alcohol use. Specifically, the literature review examines what types of alcohol use have been examined in relation to social network structures, how social network structures are related to adolescent alcohol use and the implications for public health.

Materials and methods

A search on PubMed and Sociological Abstracts was conducted to identify relevant keywords contained in the title, abstract and subject descriptors. Searches included combinations of the following terms: alcohol, binge drinking, substance use, social network, friendship network, peer influences, youth and adolescents.

Results

This review shows that while studies have generally examined moderate alcohol use, initiation and heavy use have been less studied. In terms of social network structures, researchers have mainly focused on influence/selection, network relation type and sociometric positions. While the literature is often ambiguous in terms of the association between network structures and adolescent alcohol use, there are some instances where the literature paints a coherent picture. The

literature tends to agree that both selection and influence is important when explaining peer similarity in alcohol use and popular adolescents tend to be at risk for alcohol use.

Discussion

Based on the literature reviewed, this paper offers four recommendations for future social network research that may help fill current gaps in the literature: (1) focus more on harmful use of alcohol and alcohol initiation, (2) determine whether resistance skills work differently based on network relation type, (3) focus more on how adolescent social networks are formed and how these formation processes influence adolescent alcohol use and (4) examine whether use of network data can support peer-led alcohol use interventions and identification of peer leaders.

Conclusion

The limited available literature suggests that there are significant structural and alcohol use aspects of peer relations that are important to adolescent alcohol use. Future research should continue to apply social network analysis to the study of adolescent alcohol use to improve the knowledge which can be used to develop better prevention and intervention programs to reduce alcohol-related harm.

Introduction

Adolescent alcohol use has adverse consequences in terms of psychological, social and health functioning¹. Since adolescent alcohol use is commonly understood as a peer group phenomenon, insight into the social context that influence adolescent alcohol use may facilitate the development of more successful intervention programs. Social

network analysis (SNA) allows direct identification of structural properties of peer relations and alcohol use by peers and is thus a particularly powerful approach to study the peer context of adolescent alcohol use.

SNA typically asks adolescent respondents to provide friend's names (and sometimes other information that describe the relationship) and peer data are collected directly from peers. As such, these data involve a set of social actors and the ties among them, which forms the basis for examining social networks. SNA is based on the premise that the nature of actors and the ties among them constrain individual behaviour to become consistent with the norms, expectations and behaviours of the network, and also that 'the structure of a network has consequences for its individual members and for the network as a whole, over and above effects of characteristics and behaviours of the individuals involved'².

The current review examines what types of alcohol use have been examined in relation to social network structures and how social network structures are related to adolescent alcohol use. After discussing the major conclusions that can be drawn from the existing literature, this paper considers the limitation of the literature from a public health perspective before it offers recommendations for future research directions. The objective of this paper is to provide readers with an overview of the current social network literature relevant to adolescent alcohol use. Furthermore, the objective is to move the research field forward in a way that has the potential to better serve stakeholders in the field of adolescent alcohol prevention.

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Materials and methods

Search strategy

A search on PubMed and Sociological Abstracts was conducted to identify relevant keywords contained in the title, abstract and subject descriptors. Searches included combinations of the following terms: alcohol, binge drinking, substance use, social network, friendship network, peer influences, youth and adolescents. When reviewing the literature, reference lists were checked for additional literature and researchers with a known interest in the field were consulted regarding existing publications.

Exclusion/inclusion criteria

Papers were included if they presented peer-reviewed, English language analysis. Only studies based on complete networks and with possible nomination of at least five friends were included in the review. A minimum of five peer nominations has previously been used as a cut-off for adequately collecting data on complete social networks³.

Results

Most of the studies reviewed have focused on lifetime⁴⁻⁶, past year^{7,8}, current alcohol use^{4,9-15} or a combination of these moderate alcohol use measures^{7,8,16-23}. Somewhat fewer studies have focused on heavy alcohol use^{6,18,19,23-25} and only two studies have focused on alcohol initiation^{19,26}. In terms of social network measures, the studies reviewed have generally focused on three broad domains: (1) influence/selection, (2) network relation type and (3) sociometric position.

Influence and selection

One of the most common social network aspects examined in relation to adolescents alcohol use is peer selection and influence. Indeed, while it has long been known that adolescents are similar to their friends in alcohol use²⁰, SNA has been used to

examine whether this is due to selection (homophily—individuals interact with people that are similar to themselves) and/or peer influences (people adapt the behaviour of their friends).

Findings from network studies are mixed in regards to the relative importance of selection and peer influence on adolescent alcohol use. Many studies^{4,8,9,16-18,26-28} have found evidence that both processes are important for understanding peer similarities in alcohol use. Others have, however, found that peer influence is more important than peer selection^{6,20,25}, which is somewhat contradictory to Knecht and colleagues¹⁰ who found selection to play a relatively more significant role than social influence in predicting similarity between friends' alcohol use.

It has been suggested that the discrepancy in the findings related to selection and peer influence is due to moderation effects of age not explicitly examined in many studies. Indeed, two studies^{4,16} have specified that, during early adolescence selection processes play a particularly important role, whereas during mid-late adolescence influence processes seem to become more important.

In addition to the moderating role of age, one study reviewed²⁵ tested whether self-control efficacy moderate the effect of selection and peer influence on individual alcohol use. Results show that adolescents reporting high levels of self-control efficacy were less likely to adopt the problematic drinking behaviours of their friends compared to adolescents reporting average and low levels of self-efficacy.

Another potential moderator of peer similarity in alcohol use is school-level alcohol use. The only study that has examined this showed that adolescent-peer similarities are greater in schools with higher overall levels of alcohol use²¹. The

authors note that this is an indication that high school prevalence rate increases opportunities for contact with alcohol-using peers and thus more similarity between peers.

Network relation type

Theoretically, reciprocal friendships and best friends offer high friendship quality and may therefore result in more opportunities for influence processes¹⁸. On the other hand, it has been proposed that non-reciprocal friendships may be strong determinants of alcohol use as a person who nominates someone who does not nominate him or her back may be trying hard to win a friendship which may in turn render the person susceptible for influence of potential alcohol use of non-reciprocated friends¹³.

Network studies that have examined the influence of different relational ties have painted an inconclusive picture as to the effects on adolescents alcohol use. Two studies have found support that the influence within reciprocal friendships is stronger than within non-reciprocal friendships^{7,18}. This is contrary to a study that found stronger support for the influence of non-reciprocal friends¹³, and an additional study that found that the strength of influence of friends did not differ between non-reciprocated and reciprocated friendships¹⁶.

It has also been shown that adolescents are equally influenced by their nominated and nominating friends and that influence of best friend is weaker than for non-best friend⁷. This is again contrary to findings by Urberg et al.¹⁹ who found the influence of best friend to be stronger than friend group.

Sociometric position refers to social network structures such as whether an adolescent is a group member of dense networks, loosely connected with peers, liaisons, part of dyads or isolates and thus relatively unconnected to peers. According to prevailing beliefs that

alcohol use is a group behaviour, it may be assumed that adolescents who are part of larger groups are more likely than isolates to drink¹¹. Core sociological theoretical framework also presumes that peer influence is strongest in close-knit groups and in triads because of the heightened potential for two-against-one pressure to lead to conformity to norms¹¹. On the other hand, it has been suggested that loose ties may influence alcohol use simply by the fact that weaker connections among adolescents permit rapid transmission of behaviours.

Studies that have examined the association between various sociometric positions and adolescent alcohol use have not found straightforward relationships. Pearson et al.¹¹ found that sociometric position was only different according to alcohol use for males in high SES schools and for these adolescents alcohol rates were highest among both large group members and isolates, while it was lowest in dyads. This is in contrast to two studies that show social isolation to be protective of alcohol use^{15,23}, another study that found no evidence that isolated positions predict alcohol use^{15,22} and yet another study¹² that found no significant effects for various network positions or for the interaction between network position and network alcohol use. Ennett et al.¹⁵ on the other hand, found that dense networks was a protective factor for alcohol use whereas nominating friends outside the school was a risk factor for alcohol use.

Popularity/status is a sociometric position that has received particular attention by researchers. Adolescents who are perceived as popular may be particularly inclined to engage in risk taking, as it allows them to project an adult image and may thus be one of the strategies that popular adolescents use to achieve and maintain their elevated social status⁶. Popularity/high status is

commonly a measure of how many friend nominations adolescents get from their peers (indegree). An alternative way to measure popularity is to ask students to identify peers who in the school are considered to be the most popular.

Studies have found evidence for the theoretical proposition that popularity is a risk factor for adolescent alcohol use^{6,9,11,14,22,23}. Two studies^{15,24} highlight that the popularity effect may be age-dependent in showing that received nominations is more strongly related to alcohol use risk in old than young adolescents.

From a somewhat different perspective, it has been suggested that youth culture value alcohol and, thus, that adolescents prefer friends who drink. As such, issues of popularity is not only based on indegree, but also related to who the adolescents nominate as friends. Valente et al.⁵ found that naming popular peers (at the grade but not the classroom level) who drink is associated with drinking. Other studies have found evidence that popular adolescents are more likely to select friends with frequent alcohol use¹⁰ and that rates of alcohol use is particularly high among adolescents who nominate many peers¹¹.

Discussion

SNA allows researchers to study the peer context of adolescents and how it relates to different aspects of alcohol use. As such SNA has the potential to provide valuable information that may be used to prevent adverse health effects related to adolescent alcohol use. Most relevant SNA studies focus on moderate drinking and not heavy drinking. This is problematic as it results in an inadequate knowledgebase for alcohol consumption patterns that is most harmful to health. Furthermore, a few studies have focused on alcohol initiation. This is also a gap in the literature that ought to gain more attention by SNA researchers as early alcohol

initiation is associated with alcohol problems later in life¹.

The current literature review points out that the limited, albeit growing evidence base for how adolescent social networks is related to alcohol use is far from coherent. This is maybe to be expected as each social network is unique and thus results may not be subject to generalisations. However, and despite contradictory results, the literature points to a few general observations that have implications for public health.

First, SNA show that peer influence is important to adolescent alcohol use. As such, prevention programs aimed at preventing peer pressure is a sound strategy. However, and while more data on the moderating role of age on peer influence on alcohol use is needed, the current literature suggests that programs focusing on the role of peer pressure may need to be sensitive to the increased importance of peer influence with age. Additionally, while peer resistance training is usually broad in defining a peer, the potential differential influence of reciprocated and non-reciprocated peers implies that future research should determine whether some resistance skills work differently based on the network relations type.

Second, evidence that peer selection is important in adolescent alcohol use implies that prevention programs and research efforts ought to include a stronger focus on peer group formation. Prevention efforts have hitherto paid little attention to the fact that selection of friends is important to adolescent alcohol use and SNA that focus on adolescent alcohol use have not examined how adolescents select their friends.

Extracurricular activities is one of the main sources of adolescent peer group formation²⁹ and studying these participation in these activities combined with peer selection and alcohol use may be crucial for understanding how to prevent selection into risky adolescent peer networks. It is, for

instance, possible that participation in structured activities that include adult supervision and peer interaction (e.g. scouts) creates the opportunity for adolescents to select into peer networks that are likely to be safer in terms of alcohol use than networks based on participation in high-risk, unstructured extracurricular activities without adult supervision (e.g. surfing). However, as far as the author is aware of, no studies have examined the link between adolescent extracurricular participation profiles, peer selection and adolescent alcohol use.

In summary, while extant literature suggests that peer selection is important in the development of adolescents alcohol use, there is a lack of studies that adequately examine how peer selection occurs and how these mechanisms relate to adolescent alcohol use. This in turn creates a lack of knowledge as to how one may prevent selection into and formation of social networks that are prone to alcohol use. Clearly, SNA can be broadened to include mechanisms of peer selection which in turn can help develop knowledge pertinent for adolescent alcohol prevention efforts.

A third public health implication of the current review is related to findings that popular adolescents are at risk for alcohol use and also that adolescents tend to select popular adolescents as friends (and thus likely drinkers). These findings provide support for current prevention efforts that target peer leaders to disseminate 'anti-drinking' messages. The current literature review suggests that this is a valuable strategy because promotion of anti-drinking messages among popular adolescents is likely to target the adolescents at most risk for alcohol use problems. Secondly, targeting popular adolescents for disseminating anti-drinking messages may successfully limit the acceptance and attractiveness of alcohol use due to popular students' high visibility and

larger network of friends, which may be instrumental for establishing social norms for alcohol use.

A relevant public health implication is that network data can be used to improve the selection process of peer leaders and the groups of peers they are allocated to. Peer-led intervention success may depend on identifying the adolescents with most power to influence their peers. While teachers commonly select peer leaders, gathering network data before a peer leader intervention may help identify popular adolescents and thus the leaders most likely to make the most impact. More research is needed that examine the effect of interventions based on network data for selection of peer leaders.

Conclusion

Adolescence is a period of life with major developmental and social changes that place adolescents at risk of alcohol use and abuse, which in turn has serious public health implication. It is necessary to identify underlying mechanisms that may be influenced in order to create successful adolescent alcohol prevention programs. Considerable developments in SNA have been made in the last decades making it possible to understand better adolescent peer dynamics and their relation to alcohol use. The limited available literature suggests that there are significant structural and alcohol use aspects of peer relations that are important to adolescent alcohol use. Future research should continue to apply SNA to the study of adolescent alcohol use to improve the knowledge which can be used to develop better prevention and intervention programs to reduce alcohol-related harm.

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