E-cigarette use

A look at how school nurses can address this growing trend

Over recent years, the prevalence of teenage vaping in the UK has significantly increased. (NHS Digital, 2022), making this a key area of concern for school nurses. This paper will examine the attitudes of adolescents toward vaping and their reasons for doing so. It will also consider the current ways in which adolescent vaping is addressed in education and by school nurses. Further approaches and recommendations which may enhance school nursing practice will also be considered.

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Electronic cigarettes, also known as e-cigarettes or vapes, are devices which were intended to be used to assist an individual with reducing the number of traditional cigarettes they smoke, or cease smoking completely. The practice of using e-cigarettes is known as vaping (Centers for Disease Control and Prevention [CDC], 2022). In e-cigarettes, liquid which usually contains nicotine, the addictive substance found in traditional cigarettes, is heated to create a vapour which is then inhaled (CDC, 2022). E-cigarettes come in a variety of models; early generation e-cigarettes were disposable and designed to resemble the look of a traditional cigarette, whereas newer models tend to be larger in size and rechargeable (Action on Smoking and Health [ASH], 2021).

Despite it being illegal to purchase any e-cigarettes or vaping liquid in the United Kingdom for anyone below the age of 18 years (Rubery, 2022), a survey completed in 2022 by Action on Smoking and Health (ASH) reported that 7% of young people aged 11–17 were current e-cigarette users; this represents an increase of 3.7% from 2021 (ASH, 2022a). The survey also showed that the use of disposable products among young people aged 11–17 who vapped increased from 7.7% in 2021, to 52% in 2022 (ASH, 2022a).

Although research demonstrates a positive correlation between the use of modern e-cigarette products and smoking cessation in adults (Brose et al, 2015; Hitchman et al, 2015), there is evidence to suggest that the use of e-cigarettes in teenagers and young people can be harmful and unbeneficial (CDC, 2022; Martinelli, 2022). Controversially, research has also suggested that rather than vaping being an effective method of smoking cessation, it may lead to the formation of new nicotine addictions, which may lead to uptake and continued use of smoked tobacco products, particularly in adolescents (Al-Hamdani and Manly, 2021). A systematic review and meta-analysis completed by Soneji et al (2017), supports findings from Al-Hamdani and Manly (2021) by demonstrating that adolescents who use e-cigarettes are over three times more likely to become cigarette smokers, when compared to individuals of a similar age who have never used e-cigarettes (it was unclear whether other risk factors such as parental smoking were controlled for).

Adolescents frequently participate in reward-seeking behaviour which may make them more likely to start using e-cigarettes, due to nicotine inducing the reward pathway within the brain (Galvan, 2010; Addicott et al, 2019). The use of e-cigarettes is becoming

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increasingly popular in teenagers who have never previously smoked, with concern increasing around the advertisement of e-cigarette products (Eardley, 2022). Furthermore, in a 2022 youth survey, 65.4% of respondents who said they had tried vaping, had never previously smoked (ASH, 2022a). Research has shown that over one third of adolescents consider e-cigarette marketing to be appealing, and that there has been an increase in the number of teenagers and young people noticing and viewing e-cigarette advertisements, since 2017 (Cancer Research UK, 2021). Furthermore, it is thought that the bright colours commonly used in the manufacture of e-cigarettes, particularly disposable products, and the vast range of liquid flavours, are factors that likely to appeal to adolescents (Eardley, 2022). A survey in 2022 found that the most used liquid flavours by individuals aged 11–17 were fruit flavours (56.7%) and other liquids sweet in flavour (16.2%) (ASH, 2022a).

It is concerning that a proportion of adolescents believe that the physical and mental health effects of e-cigarette use are non-existent or very minimal (Blume and Lines, 2020). Although the long-term effects of vaping are currently unclear (Cancer Research UK, 2021), evidence demonstrates that adolescents using e-cigarette products are more likely to suffer from a chronic cough and experience inflammation within the lung tissues (McConnell et al, 2017; Miyashita et al, 2020). Furthermore, research has shown that vaping can lead to gum disease (Jeong et al, 2020); this is particularly concerning since children and teenagers in the UK already miss on average three school days a year, due to oral health problems (Office for Health Improvement and Disparities, 2022).

Due to the vulnerability of the brain during teenage years, adolescents are more susceptible to nicotine addiction, when compared to older adults (Pentz et al, 2015; UNICEF, 2018). Additionally, the use of nicotine in adolescence can lead to problems with attention, cognition, and concentration, and the worsening of any existing mental health disorders, or suicidal thoughts (Livingston et al, 2022; Virgili et al, 2022).

In 2019, the UK Government set a target to be a 'smoke-free' nation by 2030, which is defined as less than or equal to 5% of the population being continuous tobacco smokers (Cabinet Office and Department of Health and Social Care, 2019). An independent review into the UK government's 'smoke-free' plan emphasised the need to offer e-cigarettes as an alternative to traditional tobacco use, however, the review also expressed that a balance between helping individuals quit smoking while protecting the adolescent population from starting to use e-cigarette products was necessary (Khan, 2022).

Vaping in children and young people

This article aims to examine and critically analyse the use of e-cigarettes and the practice of vaping among teenagers and young people. Three themes were identified from the literature found, and are detailed below. A search of the 'CINAHL' database was completed using 'teenagers OR adolescents OR adolescence OR youth', AND 'vaping OR vape OR electronic cigarettes OR e-cigarettes'. The terms used to form the above search are far-reaching and a large number of results were generated, furthermore, only one database was searched; both of these will have resulted in limitations.

Reasons for vaping

A survey of teenagers and young people, completed in 2016, found that over one third of respondents cited their main reason for vaping as the availability of various sweet flavours, such as chocolate, mint, and fruit (Truth Initiative, 2020). In addition, another survey found that 97% of teenage vapers use flavoured vaping liquids (Rostron et al, 2020).

Flavour is the most commonly used persuasive marketing technique adopted by companies to encourage the purchase of consumable products, mostly sweets and chocolate (Jenkin et al, 2014), furthermore, exposure to these advertisements is positively correlated with consumption in children and teenagers (Cairns et al, 2013). Research completed on e-cigarette marketing demonstrates similar patterns; advertising flavoured e-cigarette liquids on social media improves interaction (Liang et al, 2016), and advertisements of flavoured disposable vaping products are also linked to the uptake of vaping in teenagers and young adults (Zhu et al, 2014).

Interestingly, research completed by McKelvey et al (2019) found that over half of respondents, aged 14–17, perceived advertisements of flavoured e-cigarette liquids to be directly targeted at their age group, and not older adults who are legally permitted to use e-cigarettes. In some European countries, such as Denmark, the sale of flavoured liquid for e-cigarettes is prohibited, although these remain legal in the UK (Chemnovatic, 2021).

Within the examined literature, pressure from peers has been identified as a reason for teenage vaping Research completed in 2021 investigating the influence of friends on teenage vaping found that respondents aged thirteen-to-eighteen cited their friends vaping as the most common reason that they themselves started to use e-cigarette products (Groom et al, 2021). Another reason for teenage vaping identified within the literature is copying the behaviour of family members. Children learn by imitating the behaviour of their caregivers, making it more likely that teenagers and young adults will vape if they have witnessed adults around them smoke or use e-cigarettes (Nauret, 2018); this is further supported by research completed by Sunday et al (2021), who found that teenagers whose parents are smokers are 55% more likely to try e-cigarette products themselves.

Attitudes toward vaping

Although the number of teenagers and young people smoking in the UK has decreased, the prevalence of teenage vaping has increased in recent years, despite e-cigarette products having been on the market for over a decade (Martinelli, 2022; NHS Digital, 2022).

Literature in recent years has shown that teenagers perceive e-cigarette products to be less harmful than traditional tobacco products, or not harmful at all (Jankowski et al, 2019). Furthermore, evidence has also shown that teenagers and young people consider fruity or sweet e-cigarette flavours to be less harmful than their tobacco flavoured counterparts (Truth Initiative, 2020). The reason for these misperceptions by teenagers and young people may be explained by the immaturity of the teenage brain, with adolescents being less likely to consider the long-term consequences or effects of their actions (UNICEF, 2018).

Another reason which could explain that adolescents may consider the use of e-cigarette products to be less harmful

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than smoking, is the advertising tactics used by companies selling e-cigarette products (Truth Initiative, 2021). As previously mentioned, research has shown that teenagers perceive some e-cigarette advertisements to be directly aimed at their age group (McKelvey et al, 2019). In addition to this, in some US states, e-cigarette products have been displayed on countertops next to sweets and chocolate, an area which may experience high interest from the adolescent age group (Truth Initiative, 2021).

In the UK, advertising laws regarding e-cigarettes are much less strict than those of traditional tobacco products; since 2012, retailers must keep cigarettes and rolling tobacco hidden behind screens, however, there are currently no laws regarding the display of e-cigarette products or liquids (Department of Health and Social Care, 2012; Medicines and Healthcare Products Regulatory Agency, 2022). In early April 2023, the UK government announced their intention to consult on banning flavoured disposable e-cigarette products, most commonly used by teenagers, and expressed the crucial need to address the issue of e-cigarette marketing targeting teenagers and young people (ASH, 2022b; Barnes, 2023).

Current approaches to teenage vaping

Blume and Lines (2020) suggest that the role of a school nurse in a vape-free school should include advocating against punishment procedures for teenagers and young people who are caught vaping, delivering tobacco and e-cigarette education, and supporting groups within schools that raise awareness of the dangers and health effects of vaping. Education settings often already have a smoking/vaping policy in place, which usually results in school exclusions for those individuals caught. However, evidence demonstrates that such punishments can have a long-term negative impact on students (Public Health Law Centre, 2019), with Blume and Lines (2020) also emphasising the importance of education settings recognising vaping as an addiction, and treating it as such.

Research demonstrates that school exclusion is closely linked to the development and worsening of mental health problems in adolescents (Ford et al, 2018), moreover, poor mental health can lead to substance abuse and addiction, which poses the question if school exclusions actually cause more harm than good for children and young people who vape (National Institute of Mental Health, 2023).

Although literature demonstrates that there is a lack of education and support within the UK national curriculum for teenagers who vape (Aravind and Kunadian, 2022), the National Association of School Nurses (NASN) in the United States have developed a toolkit that can be used by school nurses to address vaping in teenagers and young adults, through cessation programmes and communication strategies (NASN, 2021). Additionally,

teenagers and young people in the USA can use a free texting service developed by Truth Initiative, where they receive periodic age-appropriate text messages in relation to vaping or smoking cessation (Truth Initiative, 2023). This texting service developed by Truth Initiative may prove beneficial since over 95% of teenagers in the USA have access to a mobile phone (Schaeffer, 2019). However, a Cochrane review in 2019 found that texting services, when used alone, are minimally effective at helping individuals with smoking or vaping cessation (Whittaker et al, 2019).

Although evidence of large-scale vaping support and cessation programmes in the UK aimed at adolescents is lacking, a programme has been developed in Cambridgeshire titled 'Catch Your Breath', which aims to prevent smoking and vaping at an early age, by supporting teachers to deliver sessions to children aged between 7 and 11 (Healthy Schools, n.d.). The 'Catch Your Breath' programme is led by the Healthy Schools team and adopts a school-based approach to vaping cessation, as recommended by the National Institute for Health and Care Excellence (NICE(National Institute for Health and Care Excellence, 2023).

Discussion

Although the Royal College of Nursing (RCN) toolkit for school nurses highlights smoking cessation as a priority health area for children and young people, most approaches in the UK appear to be online based, or delivered in education, without the involvement of school nurses (RCN, 2019). Furthermore, a major critique of the RCN toolkit is that smoking cessation is considered, but vaping is not; this guideline may benefit from an update to recognise vaping as a separate habit, as recommended by NICE (NICE, 2023; RCN, 2019). The Nursing and Midwifery Council (NMC) code stipulates that nurses should be working with the most up-to-date evidence, which currently is that smoking in teenagers and young people has decreased, whereas the prevalence of vaping has increased. This is not reflected in the current version of the RCN toolkit for school nurses (NMC, 2018; RCN, 2019; NHS Digital, 2022).

Blume and Lines (2020) suggest that school nurses should deliver tobacco and e-cigarette education in schools on a regular basis, however, currently in the UK there is minimal evidence of school nurses delivering this education (Aravind and Kunadian, 2022). Previous research by Pbert et al (2011) has demonstrated the efficacy of a school nurse-led smoking cessation intervention in schools, which improved smoking abstinence and reduced smoking frequency in adolescents. Although this intervention was successful, NICE emphasises the need to discuss vaping separately to smoking, therefore an intervention implemented to develop school nursing practice would need to be tailored only to vaping (NICE, 2023).

The smoking cessation approach evaluated by Pbert et al (2011) included four one-to-one sessions for students with the school nurse over 4 weeks. These sessions used a '5 As' model; ask, advise, assess, assist, and arrange. Research suggests that one of the successful elements of this approach was the open-ended nature of the questions asked by the school nurse; Albudaiwi (2017) suggests that open-ended questions allow school nurses to paint a holistic picture of the adolescent's life, considering not just vaping or addiction, but also social and emotional factors which may impact choices that are made. A similar approach, tailored toward vaping, would develop school nursing practice in the UK, and may be successful. However, the service pressures and time constraints faced by school nurses may make this approach difficult to sustain (RCN, 2016).

Delivering health promotion initiatives on a larger scale, such as through school assemblies or PSHE (personal, social, and health education) lessons, is an integral part of the school nurse's role (Hoekstra et al, 2016); this may be a more time-efficient approach to educating children and young people about the consequences and dangers of vaping. In addition, a whole-school approach to wellbeing education, such as a school nurse-led assembly, provokes behavioural adjustment and ensures that all children and young people needing support for vaping are identified and included (Goldberg et al, 2019; NICE, 2022).

A recent review of the literature completed by Vinci (2020) determined that cognitive behavioural therapy (CBT) is a successful method for smoking cessation. Evidence demonstrates that CBT is an effective approach to treating substance use disorders and addictions (McHugh et al, 2010). Given the efficacy of CBT for addiction and smoking cessation, CBT may also be an appropriate intervention for teenagers and young people who vape. In the UK, CBT is usually offered by appropriately trained mental health practitioners, however, literature demonstrates that in Australia, CBT has also been delivered by school nurses (McLoone and Rapee, 2012; National Health Service, 2022).

To further develop school nursing practice in the UK, CBT sessions could be offered by school nurses to adolescents who vape, but it must be acknowledged that this would involve providing school nurses with the appropriate training to deliver CBT, and due to time constraints and service pressures, it may not always be feasible for school nurses to commit to delivering individual sessions to multiple adolescents (Dawe and Sealey, 2019; British Association for Behavioural and Cognitive Psychotherapies, 2021). Besides, previous research has also shown that some children and young people can associate CBT with feelings of stigma (Halder and Mahato, 2019) which may be considered a weakness of using CBT for vaping cessation. This suggests that a whole-school approach or an intervention which is delivered to a larger audience, such as individual year groups, may be a more realistic and beneficial approach to developing school nursing practice.

When considering any approach to adolescent vaping for school nurses, it is important to examine the underpinning theory behind the approach, and if this incorporates a behaviour change model. The trans-theoretical model (TTM) of behaviour change was first proposed by Prochaska and DiClemente (1983), to address the process of changing addictive behaviours, and it includes five stages: pre-contemplation, contemplation, preparation, action, and maintenance. Research completed by Tseng et al (2022) incorporated the TTM of behaviour change into their smoking cessation intervention, using different approaches at each stage (e.g. conscious raising and self-evaluation at pre-contemplation, self-liberation at preparation, and stimulus control at action). Tseng et al (2022) observed a significant improvement in the prevalence of smoking from 31.5% after six months, to 10.7% after 4 years.

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Although incorporating the TTM of behaviour change into interventions that address addictive behaviours such as vaping appears to be successful, this may not be the case when considering approaches for children and young people. The TTM of behaviour change assumes that individuals make logical and coherent plans during their decision-making processes (Laranjo, 2016), however, due to brain development, adolescents are more likely to participate in risk-taking behaviours without considering logic or coherence when making their decisions (Steinberg, 2008); this is suggestive that the TTM may not be an appropriate model to use when implementing approaches to address teenage vaping. Furthermore, the validity of the TTM model has been questioned and there have been calls for it to be abandoned in smoking cessation (West, 2005). In contrast, the COM-B behaviour change model may be a more beneficial choice to be used with children and young people to initiative behaviour change; the COM-B behaviour change model is flexible and adaptive, and uses a theoretical and systematic approach to behaviour change which may result in more effective health promotion, in children and young people (Carney et al, 2016).

Nicotine, found in some e-cigarette products, can initially reduce stress and improve an individual’s mood and concentration, despite its long-term consequences (McConnell et al, 2017; Mental Health Foundation, 2021); because teenagers can experience high periods of stress during exams, family disputes, and problems with friends at school, it is reasonable to think adolescents may turn to vaping as a method of coping with this stress (American Academy of Child and Adolescent Psychiatry, 2019).

Research has demonstrated that mindfulness is an effective coping strategy to help individuals who are experiencing stressful situations (Bartlett et al, 2021; National Health Service, 2022). Furthermore, a study completed by Lotfalian et al (2020) found mindfulness programmes also reduced nicotine cravings and smoking behaviour.

Henry et al (2022) evaluated the feasibility of a school nurse-led mindfulness programme used in the United States; the programme consisted of 15 1-hour lessons delivered by the school nurse to individual classes. The study demonstrated that it was feasible for a school nurse to deliver these sessions, and the mindfulness programme was well received by the children, who felt it had some benefit to their overall emotional wellbeing (Henry et al, 2022). Although this programme was feasible and successful in the US, it may not be possible to replicate this in the UK due to the high workload faced by many school nurses (RCN, 2016).

Recommendations

Based on the literature discussed in this article, the following recommendations can be made:

- School nurses can support children and young people to help build resilience and develop effective coping strategies, without the use of vaping. Jha and Kraguljac (2021) suggest that approaches used to address adolescent vaping should focus on the development of healthy coping strategies.
- Given that adolescents frequently participate in reward-seeking behaviours (Galvan, 2010), this paper recommends that approaches delivered by school nurses to address teenage vaping should encourage and emphasise the health rewards that vaping cessation will bring, such as improved respiratory and cardiovascular health (Pringle et al, 2018; Holland, 2023).
- The NHS website provides an abundance of information on how beneficial vaping is to help stop smoking, however, the NHS provides no information related to vaping cessation (NHS, 2022). When health and government organisations are publishing information about the use of vaping as a smoking cessation aid, more consideration could be given to adolescents. It may be beneficial for the NHS to provide alternative advice about vaping cessation, particularly aimed at adolescents.
- Blume and Lines (2020) suggest that school nurses should take an active role in education related to e-cigarettes and vaping. This paper recommends that school nurses discuss the health risks of vaping with adolescents at every appropriate contact.
- Delivering health promotion initiatives is a key element of the school nurse role (Hoekstra et al, 2016). School nurses should also take opportunities to deliver vaping and e-cigarette education as a whole-school approach, potentially during assemblies.

Conclusions

The prevalence of teenage vaping in the UK, and globally, has significantly increased over recent years, and should be considered a major health concern given the negative physical and mental health consequences that vaping can cause (ASH, 2022a; McConnell et al, 2017). The knowledge and skills that school nurses have put them in an ideal position to support adolescents with vaping cessation, and a variety of individualised or whole school approaches may be used to achieve this (RCN, 2019). **CHHE**

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