

Obesity Prevention in Young People: The Role of Technology in Primary Care

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Abstract

In developed countries, such as Australia, overweight and obesity affects approximately 1-in-3 young people during adolescence and young adulthood. Young people with a high body mass index (BMI) during youth are more likely to remain overweight or obese throughout their adult life. Despite specific youth based health services, most young people in Australia primarily visit a General Practitioner (GP). These visits provide opportunities for overweight and obesity prevention services. A shift in focus of the primary health care model towards technology-based prevention service delivery is essential to addressing the rising burden of obesity in young people. Technology-based health promotion using mobile health ('mhealth') has shown potential in obesity prevention, as well as other health priority areas of young people. In this review we discuss and review the potential use of mhealth in primary care for the prevention of obesity in young people, and we provide recommendations for further research

Keywords: Adolescents, Young adults, Overweight, Obesity, Prevention, Technology, Primary care

Introduction

Globally, there are 1.8 billion young people between the ages of 10 and 24 years - more today than at any other time during history [1]. Adolescent (13-18 years) and young adult (18-24 years) obesity rates are also high and have increased in recent decades [2]. Halting the rise in overweight and obesity levels is pertinent for young people, as the incidence of obesity is increasing among younger people in developed countries [3]. Moreover, data suggests 80% of adolescents who are obese by the age of 18 will remain obese into young adulthood and throughout their adult lives [4]. A shift in focus more towards prevention within the primary health care is required if young people are to make a healthy transition from adolescence into adulthood.

Primary health care for young people can be provided either in youth-specific health services or community programs; however, the bulk occurs in general practice [5]. With the ever increasing population, most current primary health care prevention and health promotion services across the globe are insufficient alone to meet the health needs of today's young people [6]. Indeed obesity management and prevention services for young people are often omitted by primary care services because there is an assumption that young people are a healthy population group who rarely present to their general practitioner (GP) [7]. That happens because primary care services tend to be dominated by acute health management in adults and older people. Importantly though, most young people do visit their GPs, with over 80% of Australians aged 15 years or over visiting a GP at least once per year [8]. In the United Kingdom young people visit their GP on average two to three times per year and 70% visit a GP at least once each year [9]. These visits would therefore offer an opportunity to discuss and implement obesity prevention services, among others.

A contemporary strategy for the encouragement of healthy behaviours for obesity prevention in young people could be via the utilisation of mobile technology. Specifically, this could take place by using smartphones and mobile devices to communicate with and support young people to manage their health. Most young people have access to a range of technological devices and are more likely than older age groups to report owning a smartphone [10]. Arguably, smartphones are the most important and popular device,

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and an integral part of young peoples' daily lives [11]. Moreover, approximately 75% of young people use their smartphone to seek health-related information [12]. The potential of smartphones should be further investigated as a means of health service delivery for young people. With the widespread availability of mobile technology, there is likely to be an opportunity to facilitate health service delivery and prevention programs aimed at young people. In reality, mobile health (often referred to as 'mhealth') has the potential to provide accessibility and modernise health services and promote healthy behaviours, which may prevent obesity. In this review, we discuss the prevalence and cost of overweight and obesity in young people, role of primary health care in obesity prevention, current evidence for technology to reduce overweight and obesity, and provide recommendations for future research and practice.

Overweight and obesity in young people

In the past three decades, the global prevalence of adult obesity has increased nearly twofold [13]. No developed countries have successfully halted the continuing upward trend in overweight and obesity prevalence since 1980 [3]. If this trend continues, overweight and obesity prevalence will increase to almost 60% of the global adult population by 2030 [14]. Younger generations are particularly vulnerable. There is a high burden of disease and cost attributable to the absence of age-appropriate primary care services for the prevention of obesity or its progression in young people. Escalating healthcare costs of obesity will place greater demands on global health care system.[15] In Australia, it is estimated that overweight and obesity will have a total direct and indirect cost of \$87.7B from 2015-2025 [15].

Age-related weight gains during youth are often related to lifestyle, as weight gain during adolescence and young adulthood has been positively associated with both insufficient physical activity and unhealthy dietary behaviours [16-18]. In Australia, national data from 2014–2015 showed that 28.1% and 32.6% of adolescents aged 12-15 years and 16-17 years were overweight and obese, respectively [19]. Moreover, 38.9% of young adults aged 18-24 years were overweight or obese, with a higher prevalence of overweight and obesity in young men (18-24 years, 42.3%) compared with young women (18-24 years, 33.3%) [19].

Data from a large Australian cohort study, the Australian Longitudinal Study on Women's Health Study, showed that young women gain more weight than women who were older [20,21]. In the same study it was found that young women (18-23 years, n = 8, 980) gained an average of 6.3 kg over a 10-year follow-up period, which was also more than any other age group [21]. This rapid weight gain among young women resulted in a mean increase in Body Mass Index (BMI) from 22.8 kg/m² in 1996 to 25.0 kg/m² in 2006 [21]. A recent secondary analysis of Australian Health Surveys compared prevalence and period trends in young adults aged 18–24 years from 1995 to 2012. It showed that mean BMI increased from 23.7 kg/m² (standard deviation [SD] 3.5) for males and 22.4 kg/m² (SD 4.0) for females in 1995 to 25.2 kg/m² (SD 4.8) and 25.5 kg/m² (SD 5.9) in 2011–2012 [22].

Importantly, the burden of overweight and obesity is not shared equally across all sections of society; socially disadvantaged groups are particularly vulnerable [23,24]. Lower educational attainment increases the odds of being overweight for both young males and females, and overweight and obesity

rates are higher in rural and socioeconomically disadvantaged young females [22]. The mean increase in the BMI of young people is concerning. Further, mortality risks have been shown to be higher in people who attain or exceed an overweight BMI at a younger age than in those who reach that threshold later in adulthood. People with the lowest risk maintain a BMI less than 25.0 kg/m² [25-27]. Weight gain is also positively associated with mortality, with stronger associations for weight gain among those in young adulthood [25]. Consequently, young people will experience more of the adverse metabolic effects of excess body weight, such as the early onset of chronic diseases.

Role of primary care in the prevention of obesity in young people

Primary and secondary prevention of weight gain is critical. Primary prevention of weight gain is necessary among healthy weight populations (BMI 18.5–24.9 kg/m²), and secondary prevention of weight gain is necessary among populations at high risk for weight gain [28]. A 'one-size-fits-all' prevention approach to obesity is well documented to be insufficient [29]. Young people from developed countries are the first generation to have lived in an obesogenic environment from birth. This means their food habits and physical activity patterns have been totally shaped within an environment that promotes unhealthy lifestyles [30]. In combination with unfavourable social and economic contexts, these factors may lead to more rapid weight gain [31]. Although policy efforts should focus on reducing the population's energy intake by improving the healthiness of food systems and environments, it is prudent to develop and evaluate prevention interventions specifically aimed at young people to prevent this rapid weight gain. Further, offering generic or existing adult weight gain prevention intervention is inherently flawed because of the transient nature and different communication preferences of young people [32,33]. Young people often face a unique set of life circumstances, including individual factors such as cognitive development, identity, culture, motivation, stress and socioeconomic factors, as well as social considerations, such as peer influence and stigma [34].

Compared with usual care or control treatment, brief primary care interventions are associated with a significant but small reduction in BMI z score (units BMI is above or below average BMI for a child's age and sex) in young people [35]. In order to achieve such reductions, GPs and healthcare professionals in general need specialised communication skills to interact with young people. Such skills require an understanding of young peoples' individual and social development [9]. Randomised controlled trials have shown it is possible to enhance GPs' communication strategies with young people, which results in improved health professional-patient interactions [36]. Emerging evidence suggests communication between GPs and young people about lifestyle behaviours related to obesity may further be facilitated and improved by the use of newer technologies, particularly smartphones [37].

Technology-based interventions in primary care for young people

Given the ubiquity of smartphone ownership among young people in developed countries, mhealth based services for young people may provide a feasible and acceptable option. Mobile

Health is a component of electronic health (eHealth) and is defined as 'public health practice supported by mobile devices, such as smartphones and involves the use and capitalisation on a mobile phone's core utility of voice and short messaging service (SMS)', as well as more complex functionalities such as smartphone applications ('apps') and internet access [38]. Mobile Health interventions use functionalities of smartphone communication technology to facilitate behavioural change and health improvements [38], and they offer a wide-reaching and potentially appealing health service delivery option.

There is an emerging body of evidence for the use of mhealth technologies for obesity prevention and management in adolescents and young adults [39,40]. Technology-based obesity intervention research in adolescents has shown significant changes in obesity related behaviours and subsequent changes in BMI are possible when interventions include education, goal setting, self-monitoring, and parental involvement [39]. Research trends suggest a minimum dose of one hour per week for 10 to 16 weeks is required to achieve such positive changes in obesity-related behaviours and BMI outcomes using technology [41]. However, most research interventions in adolescents and young adults recruit students within schools or university settings often from socioeconomically advantaged groups [42], and therefore the research findings may not be generalizable to a primary health care setting.

Given the diverse range of young people who visit their GP, primary health care is an advantageous setting for obesity intervention. However, the current dosage of intervention required for significant obesity prevention outcomes is not feasible for many GPs to tackle alone. Current guidelines recommend a range of medical and allied healthcare professionals should be involved in the development and delivery of successful weight management programs for all age groups [28]. As primary health care provides the first point of care for young people, GPs can play an integral role in the identification and screening of young people with health-compromising behaviours which may lead to obesity.

A recent Australian study has shown integrating a health and lifestyle-screening app ('Check Up GP') into face-to-face primary health care can improve young people's experience of seeing their GP and provide an opportunity to identify and address obesity promoting behaviours [37]. The app design was based on the theoretical principles of patient-centred [43] and youth-friendly care [44]. Young people (aged 14–25 years) using the app reported significantly greater disclosure of health issues, and scored their GP higher in components of patient-centred care, including communication and partnership, and health promotion [37]. There is potential to use this screening app in primary care for recruitment to multi-disciplinary mhealth lifestyle interventions for the prevention of obesity in young people.

Conclusions and Future Research

In this review we have discussed the prevalence and cost of overweight and obesity in young people, role of primary health care in obesity prevention and the current evidence for technology to reduce overweight and obesity. Initial research into mhealth interventions in primary care in young people has shown promise in screening and identification of obesity related behaviours. There is a need for further research, including

adequately powered Randomised controlled trials to determine the short and long-term effectiveness of mhealth interventions in obesity prevention in young people. Further, the inclusion of nest qualitative evaluations to understand the needs of young people and their communication, component and content preferences. Such research has the potential to enable individualised flexibility in communication and content delivery through the use of centralised systems, real-time data monitoring, analysis and feedback. Importantly, given the reach of smartphone technologies, research efforts should be concentrated in sub-populations of young people at higher risk of obesity, including those from lower socioeconomically and ethnically diverse backgrounds as well as young people in rural communities.

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Conflicts of interest

The authors report no conflicts of interest in this work.

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