

Christine M. Hunter
Christopher L. Hunter
Rodger Kessler *Editors*

Handbook of Clinical Psychology in Medical Settings

Evidence-Based Assessment
and Intervention

 Springer

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Part I
Introduction

Chapter 1

Psychology and Population Health Management

Alan L. Peterson, Jeslina Raj and Cynthia Luethcke Lancaster

Population health management, broadly defined, is an integrated approach to improve the health of an entire population by targeting the systems and policies that affect health care quality, access, and outcomes [1]. From a clinical psychology perspective, population health involves clinical applications and interventions targeted at an entire patient population rather than individual patients. The traditional practice of clinical psychology in medical settings has targeted the assessment and treatment of individual patients most often seen for one-on-one counseling. Decades of applied clinical research has resulted in the development of evidence-based cognitive-behavioral interventions for psychological, medical, and dental conditions that can be delivered by clinical psychologists. Indeed, the largest effect sizes and greatest improvements in clinical symptoms can most often be obtained using these empirically supported treatments delivered to individual patients. For a variety of reasons, however, it is only a minority of patients who have access to and benefit from these cognitive-behavioral therapies. Less intensive clinical interventions delivered to an entire population of health care beneficiaries have the potential to have an even greater impact on the overall patient population than more effective treatments delivered to a small percentage of patients.

Population health interventions are often integrated into standard clinical settings, with a shift in emphasis from individual patients with identified disorders or

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diseases to a larger target population. One example is the routine screening of all patients for tobacco use in a family medicine clinic followed by a brief intervention or referral for care [2]. Brief interventions can be provided by a variety of health care professionals. One of the best models for brief interventions in medical settings is the use of psychologists serving as behavioral health consultants within an integrated primary care clinic [3]. Other population health interventions can be linked to the health care system but delivered outside of the medical setting, often through information technology approaches that are alternatives to face-to-face therapy. These approaches capitalize on recent advances in technology and social networking by using multimedia tools such as telehealth, the Internet, and digital video devices.

Population health approaches provide the opportunity for clinical psychologists working in medical settings to have an even greater impact on the psychological and physical health of a population of patients. This chapter begins with a brief overview of the history of population health. It then provides definitions of population health, disease management, and related terms used to target the overall health of a population. Because tobacco use, overweight and obesity, and excessive alcohol use are the three greatest contributors to mortality in America [4, 5], this chapter will focus on population health outcomes and interventions in these areas. The sections on population-level interventions explore interventions that can be disseminated to a population to influence health determinants and improve health outcomes.

Population Health Management: An Overview

Concepts related to population health have existed for centuries. A classic example in history of the use of a population health approach is John Snow's discovery of the source of the 1848 cholera epidemic in London [6]. He created a map of the city, marking the location where people had died from cholera. In reviewing these data, Snow found that deaths due to cholera were highly correlated with locations surrounding certain water pumps. He then theorized that cholera might be spread through contaminated water supplies. When an outbreak began to affect the Broad Street area of London, Snow suggested that the town remove the handle from the water pump that he suspected was the source of the contaminated water causing the cholera. When the handle was removed and local people stopped using the water from that pump, the outbreak ended. Though Snow's efforts in this area were not recognized during his lifetime, he is now a well-acknowledged pioneer of population health.

The late psychologist George Albee is a modern-day pioneer of population health. He provided one of the most concise descriptions of the field of population health when he wrote, "no mass disorder afflicting mankind is ever brought under control or eliminated by attempts at treating the afflicted individual or by attempts at producing large numbers of individual practitioners ([7], p. 24)." The modern-day field of population health emerged because the traditional approach of explaining and treating illness on an individual level was too limiting.

Definitions of Population Health and Disease Management

From a historical perspective, clinical and research applications in population health management emerged from an area called “disease management [2].” In many health care settings, disease management refers to clinical interventions and approaches for individuals who have already developed a specific disease. This would include, for example, the optimal management of the most common and costly acute and chronic disease states, such as diabetes. However, others define disease management more broadly to include the spectrum of approaches from primary prevention to intensive tertiary treatments [8]. This might include, for example, early interventions targeting healthy nutrition, weight management, and exercise in individuals at risk of the development of diabetes. However, many physical and mental health conditions co-occur. Therefore, Schrijvers ([9], p. 9) defined disease management as follows:

Disease management consists of a group of coherent interventions designed to prevent or manage one or more chronic conditions using a systematic, multidisciplinary approach and potentially employing multiple treatment modalities. The goal of disease management is to identify persons at risk for one or more chronic conditions, to promote self management by patients and to address the illnesses or conditions with maximum clinical outcome, effectiveness and efficiency regardless of treatment setting(s) or typical reimbursement patterns.

To better reflect modern changes in the field of health care, one of the most popular research journals changed its name in 2008 from *Disease Management* to *Population Health Management* [1, 10]. In the most obvious sense, this new field of population health management can be defined as the sum of each of its terms. Population refers to a large group of individuals belonging to a certain category, such as a particular ethnicity, socioeconomic status, or religion [11]. A population could also refer to the group of patients within a particular type of health care system, such as medical beneficiaries served by the Department of Defense (DoD) or Department of Veterans Affairs (VA). Health can be defined in the negative sense, as in an absence of illness, and also in the positive sense, as in the presence of wellness [11]. Therefore, the aggregate definition of terms defines population health management as interventions or approaches to promote the absence of illness and presence of wellness in a group of specified individuals.

However, over time this field has come to encompass more than just this aggregate definition. For example, it has previously been used to refer to health determinants or to health outcomes within a population [11, 12]. Health determinants are the independent variables upon which health outcomes depend [11, 12]. For example, an increase in the prevalence of smoking in VA patients, a health determinant, would increase the rates of lung cancer in that population, a health outcome. Due to the interacting relationship between health outcomes and determinants, the most helpful definition of population health should encompass both of these concepts as well as the dynamic relationship between them. Kindig’s [11] definition fits this criterion. He defined the framework of population health as “health outcomes and their distribution in a population achieved by patterns of health determinants...over

the life course produced by policies and interventions at the individual and population levels ([11], p. 141).”

Population health management includes a combination of primary, secondary, and tertiary prevention programs. The 1957 Commission on Chronic Illness was the first to propose these categories of preventive care [13]. Primary intervention is implemented in a healthy population to prevent the occurrence of a disorder or an illness. For example, a primary prevention strategy might include a tobacco-use prevention program delivered in a pediatric clinic. Secondary prevention intervenes with an at-risk population to prevent full onset of an illness. This might include approaches to identify asymptomatic individuals who have known behavioral health risks or preclinical disease. An example is intervening with overweight patients to increase physical exercise and improve their eating habits before the onset of comorbid conditions. Tertiary prevention intervenes in populations already diagnosed with an illness to help control symptoms and severity. Examples include interventions for symptomatic patients to reduce the consequences of their disease, such as weight management for diabetics.

Clinical psychologists have much to contribute to population health management, such as the identification of valid measures for health surveillance, the proactive delivery of prevention and intervention services, and evidence-based strategies for outcome measurement [14]. Surveillance includes methods to measure or assess the health status of a population. The ability to assess the population health status of health care beneficiaries has been improved with the development of electronic health records in some health care settings such as the military and VA. Surveillance might include a review of electronic medical records to determine the prevalence of tobacco use or obesity in a specified population. Surveillance can also be accomplished through the prospective implementation of routine assessment of patients seen in a health care setting. For example, a primary care clinic might assess tobacco use and body weight during routine clinical visits.

Population-level cognitive-behavioral interventions can be administered by psychologists in a variety of ways. Some interventions can change behavior passively through behavior changes that automatically happen when the environment is altered [15]. An example of this type of intervention includes John Snow removing the handle on the water pump that accessed the contaminated water. This produced an automatic behavior change, in that the population that usually used that pump had to get water from a different pump. An example of another intervention that automatically improved dental health was observed after fluoride was added to water supplies [15]. Individuals drank the water that was available to them, which included additional fluoride, and dental health automatically improved [15].

There are four primary categories of environmental factors that can be modified to significantly affect population behavior: (1) availability, (2) physical structures, (3) social structures and policies, and (4) media and cultural messages [16]. Altering one of these four factors can have an automatic influence on trends in health behaviors within the whole population exposed to the changed environment. For example, planning a new community environment that supports and encourages walking or biking has been shown to influence physical activity, eating behaviors, and obesity

in children [17]. However, these environmental changes usually require high-level interventions at an organizational leadership or even governmental level. While this field of study is relevant to some psychologists who help to inform organizational or government officials and policy makers, the focus of most clinical psychologists' practice is within their own clinic, university, or hospital.

Interventions disseminated in a clinical setting typically require active and purposeful effort on the part of the patient to produce a behavior change. This type of intervention may be designed to change individuals' behaviors or cognitive strategies to help them adjust, alter, or augment their personal lifestyles in healthful ways [15]. Traditionally, these interventions are implemented through one-on-one counseling sessions with a therapist. However, this type of intervention can be very expensive, and the need for therapy is much greater than the availability of therapists [7].

Several new, more cost-effective approaches have been made possible through other mechanisms capitalizing on communication technologies that have become increasingly widespread such as cell phones and the Internet. One study [18] found that among patients interested in some form of behavioral treatment, 92% were interested in or would consider face-to-face treatment as compared to 63% who showed interest in telephone counseling and 48% in Web-based care. The results also indicated that time constraint as a barrier to care was more predictive of interest in telephone and Internet treatments compared to face-to-face treatments. It is estimated that nearly eight in ten individuals of the US population have a cell phone [19] and about 74% of homes in America have Internet access [20]. In addition, about 40% of Americans with Internet access use it to seek information on health or health care [21]. Therefore, these alternative methods of communication have the potential to serve as vehicles for population-level interventions for many patient populations. Psychologists who embrace population health management approaches can increase their efficiency with telephone or Web-based treatments for patients who are receptive to this approach and for disorders that can be treated effectively without regular face-to-face treatment sessions.

Tobacco Use

The Problem

Tobacco use is one of the world's greatest health risks [22]. Not surprisingly, it is also one of the most commonly targeted health behaviors for population health interventions [2]. Tobacco use caused 100 million deaths worldwide in the twentieth century, and it kills 5.4 million people annually [22]. Estimates project that if trends in tobacco use continue unchecked, it will cause 8 million deaths annually by the year 2030 [23]. In the USA, tobacco is the leading preventable cause of death, and it is responsible for approximately 1 of every 5 deaths, totaling 443,000 deaths

annually [24]. About 11% of these deaths are related to secondhand smoke [24]. Approximately 70% of American adult smokers indicate they want to quit smoking, but less than 5% do so successfully each year [25]. There is no safe level of tobacco use. Therefore, the potential target for population health interventions is anyone who consumes tobacco.

The most effective treatments for tobacco use are intensive interventions including eight or more sessions of individual or group behavioral counseling combined with medication [26]. Ranked in order of effect size, the most successful approaches for tobacco cessation are group behavioral therapy, use of bupropion, intensive physician advice, nicotine replacement therapy, individual counseling, and tailored self-help interventions [27]. Though these intensive treatments are effective and may double or triple the quit rates, for a variety of reasons, they are not widely used by or available to the majority of tobacco users [25]. Population health interventions, however, can help to increase the availability of tobacco cessation treatments. Of these interventions, brief primary care interventions, telephone counseling, and guided self-change programs—all of which can be supplemented by tobacco cessation medications—are likely to be the easiest to disseminate on a population level.

Population-Level Interventions for Tobacco Use

One of the most basic population health approaches is the universal assessment and treatment of tobacco use in primary care settings. Although the quit rates from these brief interventions are relatively low (e.g., 5–7%), when applied to an entire population of tobacco users, the overall impact can be substantial [2]. Some of these interventions can be specifically delivered in primary care, whereas other approaches may involve referral for self-change programs delivered via books, digital video devices [28], interactive Web-based interventions [29], and telephone counseling [30]. The potential impact of brief interventions for tobacco cessation is perhaps one of the best clinical examples of the impact of population health management interventions.

Another efficient method to disseminate a tailored self-help intervention is through computer- and Internet-based programs [29]. These types of tailored programs often survey the user and provide personalized feedback and advice based on their responses [31]. Programs can be tailored based on the current level of the users' motivation to quit smoking; however, these programs tend to be more effective when used with treatment seekers who are already demonstrating motivation and readiness for change [31]. Although many Web-based interventions for tobacco cessation have been developed and marketed, very few have scientific data to support their efficacy. Though a recent meta-analysis suggests that these programs can increase smoking abstinence by 1.5 times over a control group and lead to an approximate 10% abstinence rate at a 1-year follow-up [32], previous studies have found mixed results for the effectiveness of computer- and Web-based interventions [31]. A recent review of Web-based programs concluded that several programs offered

through the Internet do not cover key components of tobacco cessation programs in enough detail and could increase the amount of interaction in their programs to make treatment more personalized [33]. Overall, it seems that Web- and computer-based interventions have the potential to be effective population-level interventions, though much more research is needed to identify the most useful components of these interventions to maximize their effectiveness.

Telephone counseling is another mechanism for disseminating tobacco cessation interventions and providing tailored feedback [28]. Telephone counseling is particularly effective as an adjunct intervention and is often used to augment guided self-change interventions [34, 35]. Telephone counseling can be proactive or reactive. Proactive programs are the ones in which the counselor contacts a patient who is already involved with a cessation program, whereas reactive counseling is available on demand whenever the patient calls. Reactive counseling, which includes programs such as quitlines or help lines, can transition into proactive counseling if the counselor later initiates contact to follow up with the caller [35].

Advances in technology and changes in consumer habits continue to present new opportunities for tobacco interventions, the latest of which is the use of the text messaging capacity of cellular phones to assist with tobacco cessation. Text messaging programs can be used in combination with a Web-based component that primarily functions to set up and initiate the text messaging service [36, 37]. As with Web- and other computer-based intervention programs, text messages can be tailored to provide individuals with personalized advice. In addition, the greater accessibility of cell phones may make text messaging programs even more useful than computer- or Web-based programs. For example, users can receive automated texts at specific times of the day when they are likely to encounter smoking-related cues [37]. They also can send texts from their cell phone whenever they are struggling with cravings, and they can instantly receive automated feedback with suggestions for coping [37]. The effectiveness of smoking cessation programs utilizing text messaging has been demonstrated through studies that have reported participant cessation rates between 28 and 42% at 6 weeks after treatment initiation [36–38]. Additional studies are needed to determine the long-term efficacy of these intervention approaches.

Weight Management

The Problem

There is no question that obesity is on the rise, particularly in America. The prevalence of obesity (body mass index, $BMI \geq 30$) increased from 30.5% in 1999 and 2000 to 34.3% in 2003 and 2004, while the rate of individuals classified as overweight or obese ($BMI \geq 25$) increased from 64.5 to 66.3% [39]. In 2005, the World Health Organization (WHO) estimated that 1.6 billion people over the age of 15 in the global population were overweight ($BMI \geq 25$) and 400 million were obese

(BMI \geq 30) [40]. Global estimates project that by 2015, 2.3 billion people will be overweight and more than 700 million will be obese [39].

These escalating rates of obesity come at a high price. The cost of overweight and obesity has been estimated as US\$ 117 billion per year in direct and indirect costs [39]. Obesity has also been identified as a major risk factor for numerous chronic diseases, including cardiovascular disease, diabetes, musculoskeletal disorders, and even some cancers [40]. Likewise, higher BMI in men and women of all ages is associated with higher mortality rates [41].

Population health interventions have the potential to help alleviate the rapidly escalating weight management crisis. The primary underlying cause of obesity is simple—people consume more calories than they burn [40]; however, finding a solution is complex. Factors affecting diet and physical activity are endless, with just a few examples including increased availability of calorically dense, tasty foods, as well as modern increases in the number of sedentary jobs and sedentary methods of transportation [40]. A 2006 survey found that 62% of American adults do not engage in any vigorous activity lasting more than 10 min [39]. To reduce the rising rates of overweight and obesity, evidence-based, population health programs should be implemented to lower caloric intake and increase physical activity.

Population-Level Interventions

The most effective treatments for weight management are multisession cognitive-behavioral treatments [42]. Several behavioral treatment components have been identified as effective components of weight loss treatment, including self-monitoring, stimulus control, and cognitive restructuring [43], as well as social support, role-play, and tailored behavior instructions [44]. Though most of these interventions have traditionally been implemented through face-to-face counseling, contemporary technologies offer several other methods of implementing these interventions that may be just as effective [45, 46]. Interactive technologies, such as the telephone and Internet, increase the cost efficiency of intervention and allow for wider, more population-based dissemination [47].

For example, a meta-analysis concluded that interventions primarily consisting of telephone contact can improve diet and increase physical activity [48]. Telephone contact can be implemented by research staff, clinicians, or by automated calls, and the most effective interventions include 12 or more calls over a period of 6–12 months [48]. Phone calls are particularly useful and cost effective for providing tailored behavior instructions [49]. Specifically, helpful intervention calls might be used to provide assessment with immediate feedback, to offer advice on physical activity and diet, and to develop personal goals and plans [46, 50].

The newest version of mobile devices such as “smartphones” allow for almost unlimited possibilities for delivering and assessing population health interventions [51]. At the most basic level, modern cell phones offer text messaging services that can be used for delivering and reporting physical activity and dietary interventions.

Text messages also can be automated to provide goal reminders, such as automated messages sent at the planned time for physical activity [52]. In addition, smartphones not only allow individuals to receive tailored streaming video interventions, but they also allow patients to photograph, videotape, and audio-record various aspects of dietary-intake and physical-activity behaviors. However, much data are lacking in these areas, and cutting-edge technology does not guarantee success for such a simple (calories in; calories out) yet complex problem as weight management.

There is some research evidence to support the efficacy of Web-based programs for weight management [46, 53, 54]. Studies have shown these interactive programs to be effective in producing initial weight loss in adults [55], and preliminary evidence suggests that they may be also effective for children [56]. Some researchers have even suggested that Internet-based weight loss treatments may be as effective as face-to-face interventions [55]. The Internet is a versatile portal for providing generic education and specific suggestions, social support through virtual group bulletin boards, tailored e-mail feedback from counselors, and a space to self-monitor by logging dietary intake and physical activity [55]. Personal digital assistants, or PDAs, provide another electronic outlet for self-monitoring of diet and exercise behaviors. Although self-monitoring traditionally has been paper based, a recent study suggested that the use of a PDA to self-monitor is just as effective [57].

Excess Alcohol Consumption

The Problem

Excess alcohol consumption is often described as problem drinking, heavy drinking, or at-risk drinking and is not always accompanied by alcohol dependence [58]. According to the Centers for Disease Control and Prevention [59], heavy drinking is defined as the consumption of more than two standard drinks of alcohol per day for men and more than one standard drink of alcohol per day for women. Approximately 10% of Americans will have significant problems with alcohol at some point in their lives, with men affected more often than women [60, 61]. Excess alcohol consumption is associated with an increased risk of many medical conditions such as cancer, pancreatitis, gastritis, and cirrhosis, as well as neurological and cardiovascular problems [59]. In the US, it was estimated that 1.6 million individuals were hospitalized in 2005 and more than 4 million individuals visited emergency rooms for alcohol-related conditions [59]. Each year in the US, 79,000 deaths are reported due to excessive alcohol use. This makes alcohol the third leading cause of death in the nation, after tobacco use and overweight/obesity [4, 5, 59]. About half of Americans over the age of 12 drink alcohol, 23.7% binge drink (defined as five or more drinks at one sitting), and 6.8% binge drink at least 5 days out of the month [62].

In 2009, it is estimated that 20.9 million drug- and alcohol-use disorder cases went untreated in the US [62]. Estimates from 2005 suggest that substance abuse and addiction cost the US federal, state, and local governments US\$ 467.7 billion, exceeding the costs of heart disease, cancer, and obesity [63]. In the public sector, substance abuse and addiction contribute to higher costs in areas such as health care and the criminal justice system. In the private sector, these addictions increase costs due to problems such as decreased productivity and higher insurance rates [63]. They additionally contribute unquantifiable costs to human pain and suffering in tragedies related to substance abuse, such as car accidents, homicides, suicides, rape, and domestic violence [63].

However, as compared to tobacco, there does appear to be a safe and even healthy level of alcohol consumption. There is now considerable epidemiological evidence to indicate that moderate alcohol consumption (up to two standard drinks of alcohol per day for men and up to one per day for women [59]) is actually associated with reduced health risks and total mortality as compared to abstinence from alcohol or heavy drinking. One study [64] found that alcohol abstainers had a mortality risk more than two times that of moderate drinkers. In addition, heavy drinkers had a 70% increased risk. The level of reduced mortality for abstainers compared to moderate drinkers was decreased when the investigators statistically controlled for age, gender, former problem-drinking status, existing health problems, key sociodemographic factors, and key social-behavioral factors. However, even after adjusting for all of these covariates, abstainers continued to show an increased mortality risk of 51% over moderate drinkers and 45% over heavy drinkers. These factors are important for consideration by psychologists, because the field of substance abuse often focuses on the achievement of total alcohol sobriety as a treatment goal. From a population health perspective, a common goal is to focus on reducing excess alcohol consumption for patients identified with alcohol abuse, alcohol dependence, or a health-related condition that is negatively affected by alcohol consumption. Interventions to reduce, but not necessarily eliminate, alcohol consumption are referred to as “harm reduction” treatments for alcohol problems [65].

Population-Level Interventions

Similar to tobacco cessation and weight management, the most effective treatment for alcohol dependence is intensive individual treatment, using either a cognitive-behavioral therapy, medication, or a combination of the two [61, 66]. The largest randomized controlled trial for the treatment of alcohol dependence was the Combined Pharmacotherapies and Behavioral Interventions (COMBINE) Study [66]. This study evaluated eight different combinations of the use of two medications (naltrexone, acamprosate, or both), a combined behavioral intervention (CBI), and a placebo. The CBI treatment consisted of up to 20 sessions of 50 min each and integrated aspects of cognitive behavioral therapy, 12-step facilitation, motivational interviewing, and support-system involvement external to the study. The results of

this study indicated that patients receiving medical management with naltrexone, the CBI, or both had significant reductions on drinking outcomes (approximately 80% days abstinent). Interestingly, the combination of naltrexone and the CBI did not produce better outcomes than either naltrexone or CBI alone. Unfortunately, intensive interventions such as those evaluated in the COMBINE study are not available for most individuals with problems with excess alcohol consumption.

There are, however, a variety of population-based interventions that can help decrease excessive alcohol consumption in high-risk populations. Similar to tobacco cessation, brief interventions (<1 h) incorporating motivational interviewing and motivational enhancement approaches have been demonstrated to be effective for the treatment of heavy drinking [67, 68]. A meta-analysis indicated that heavy drinkers who received a brief intervention were twice as likely to moderate their drinking 6–12 months after an intervention when compared with heavy drinkers who received no intervention [68]. Brief interventions have also been shown to result in fewer emergency room visits and hospitalization for up to 4 years after the intervention [67]. Brief intervention is a low-cost, effective preventive measure for heavy drinkers in outpatient settings.

Web-based interventions are another approach to target high-risk drinkers and alcohol-dependent individuals in large populations. While a wide range of Web-based programs are advertised, few Web sites actually offer online treatment services, and most of the alcohol treatment programs offered are not empirically based [69, 70]. Though some studies have found promising results for Web-based interventions designed to decrease alcohol consumption [65, 71], most of the programs evaluated in research clinical trials are not publically available.

Screening and brief intervention (SBI) is an example of one method to decrease excessive drinking that has been effectively adapted to the Internet [72]. SBI includes assessment tools in the screening phase, along with assessment questions and personalized feedback in the intervention portion. The assessment includes a 14-day retrospective drinking diary, self-reported weight, and perceptions of peer drinking norms [73]. Important personalized feedback consists of summaries of recent consumption, risk status, and estimates of blood-alcohol concentrations on participants' heaviest drinking days [72].

The Drinker's Check-Up (DCU) is another example of a program that decreases alcohol consumption via the Internet. Though a Windows software version of DCU was developed for therapists and clinics, a Web-based application was also developed for the general public. DCU uses brief motivational interventions [74] and can be utilized as a separate intervention or as an introduction to alcohol treatment. This program consists of integrated assessment, feedback, and decision-making modules [74]. DCU provides a complete drinking assessment and encourages the user to change his or her behaviors using the FRAMES approach (Feedback is personalized; Responsibility for changing is left with the individual; Advice to change is given appropriately; a Menu of options for changing is offered; an Empathic style is used by the therapist; and Self-efficacy is emphasized [75]). The FRAMES approach is designed for drinkers who are unsure about changing their drinking habits.

Computer-based DCU has been found to compare favorably to DCU delivered via face-to-face contact [74].

As noted through the many examples cited here, the Web- and computer-based programs are valuable tools for clinicians and their patients. Computer-based programs can create interactive dialogues, foster patient interest, and increase levels of confidentiality. Also, computer-based programs and the World Wide Web may be an effective way to offer low-cost treatment to a greater number of clients with alcohol-related problems. Research conducted to date suggests that Internet- and computer-based programs have the potential to produce significant improvement and successful results when used as a population health management intervention [69, 72, 74].

Conclusion

The lifestyle behaviors that are the leading causes of morbidity and mortality in America—tobacco use, overweight/obesity, and alcohol use—can be significantly improved through population health management interventions. Large populations can be targeted through increasingly popular information communication methods and technological mediums, such as telephones, text messaging, and the Internet. These types of interventions have made treatment more cost-efficient by decreasing the need for face-to-face time between patients and health-care providers. Furthermore, technology-based communication has increased the availability and accessibility of interventions, especially for rural populations, while simultaneously making participation in interventions more private, even allowing for anonymity.

Several studies support the effectiveness of population-based interventions disseminated through methods alternative to traditional therapy. However, the research in this area is largely in its beginning stages, and in some areas the findings have been mixed. This is possibly due to the focus on the method of dissemination rather than treatment components. Future research in this area could work toward maximizing the effectiveness of population-based interventions by identifying the most effective treatment components that are based on empirically supported models of behavioral change.

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