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Videos to influence: a systematic review of effectiveness of video-based education in modifying health behaviors

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Abstract This systematic review examines the effectiveness of videos in modifying health behaviors. We searched PubMed (1975–2012), PsycINFO (1975–2012), EMBASE (1975–2012), and CINAHL (1983–2012) for controlled clinical trials that examined the effectiveness of video interventions in changing health behaviors. Twenty-eight studies comprised of 12,703 subjects were included in the systematic review. Video interventions were variably effective for modifying health behaviors depending on the target behaviors to be influenced. Video interventions appear to be effective in breast self-examination, prostate cancer screening, sunscreen adherence, self-care in patients with heart failure, HIV testing, treatment adherence, and female condom use. However, videos have not shown to be effective in influencing addiction behaviors when they are not tailored. Compared to loss-framing, gain-framed messages may be more effective in promoting certain types of health behavior change. Also, video modeling may facilitate learning of new behaviors and can be an important consideration in future video interventions.

Keywords Video education · Video · Behavioral change · Behavior modification · Systematic review

Introduction

Modification of health behaviors can lead to the prevention of many diseases that are associated with significant morbidity and mortality in the United States (Anand et al., 2008; Fine et al., 2004; Pronk et al., 2004). Patient educational interventions that seek to promote healthy behaviors have the potential to improve individuals' overall wellbeing.

Health information can be delivered through a number of educational media, such as written pamphlets, videos, face-to-face counseling, and web-based applications (Dorfman et al., 2010; Snyder-Ramos et al., 2005; Spiegel et al., 2011). The use of video as an educational medium offers several potential advantages. First, video interventions can be a less resource intensive means of delivering educational content. A study assessing the cost-effectiveness of a video-based human immunodeficiency virus (HIV) patient education program resulted in annual savings of US$5,544,408 for 10,000 patients in averted HIV infections (Sweat et al., 2001). Second, video interventions remove inconsistencies across educators and balance the presentation of information to provide more standardized education (Gagliano, 1988). Third, individuals with low health literacy are especially receptive to video-based education (Sobel et al., 2009). Finally, video-based education can be administered in many forms, such as videotape, digital video/versatile disc (DVD), downloadable media files, and streaming videos from certain Internet websites. In particular, educational videos delivered through video-sharing websites can quickly reach a broad audiences via social media (Backinger et al., 2011; Carson, 2011; Keelan et al., 2007; Knosel & Jung, 2011; Lim Fat et al., 2011; Murugiah et al., 2011; Pandey et al., 2010; Richardson et al., 2011; Sood et al., 2011; Steinberg et al., 2010).

However, other mediums have advantages over video-based education. For instance, although the effectiveness of written education materials may be attenuated by low literacy (Davis et al., 1998), written materials allow patients to set their own pace in reviewing information. Also, it may be easier for patients to revisit written materials compared to video, especially for those without access or who do not

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know how to operate video-viewing technology. Alternatively, face-to-face counseling offers tailored education, which allows the educator to review and emphasize information according to the unique needs of the patient. However, despite the potential benefits of other media, the increasing acceptability of video and burgeoning online presence of media-sharing technology make video an enticing medium to conveniently communicate information to patients.

This systematic review examined video interventions across various medical specialties and diseases that sought to influence health behaviors. Even though video-based interventions have been found to increase short-term knowledge (Gagliano, 1988), a systematic evaluation of the impact of video interventions on modifying health behaviors is lacking. The objective was to assess the effectiveness of videos relative to other media in changing health behaviors.

Methods

Data sources

Systematic literature searches were performed in four databases: PubMed (1975—September 2012), ProQuest PsycINFO (1975—September 2012), EMBASE (1975—September 2012), and EBSCO CINAHL (1983—September 2012). Initial searches were conducted in May of 2011, and final updated searches were conducted in September of 2012.

Search strategies using controlled vocabulary and keywords were developed with the assistance of a professional research librarian. The intent was to keep the search broad so relevant articles would not be missed. For instance, the search in PubMed consisted of the following Medical Subject Headings (MeSH) terms and key terms: "Health Knowledge, Attitudes, Practice", "Health Behavior", "Health Promotion", "Consumer Health Information", and "Video", "Video Recording", "Videotape Recording", "Video Disc Recording", "Video-based", "Digital Video Recording", "Digital Video", "DVD", or "VHS". Similar terms were tailored to each individual database. Exact search strategies can be found in Appendix. Also, reference lists from articles found through the database searches were hand-searched for potentially relevant publications.

Study selection

The inclusion criteria were the (1) use of video as an educational intervention to affect health behavior, (2) presence of a non-video comparison group, and (3) primary study published in the English literature between January 01, 1975 and September 01, 2012. Specifically, studies that used video in the form of film, videotape, and digital videos were included. In addition, studies that used video interventions in combination with an additional educational tool were included if these additional educational tools were also used in the non-video control group.

The aforementioned search strategy yielded 3,251 publications. After reviewing abstracts to remove studies that were duplicated between databases, had no control group, used video education in the control group, or did not use a video-based intervention (e.g., arcade/video game interventions), 174 articles remained. Manual reading of individual manuscripts resulted in the final selection of 28 studies that fulfilled inclusion criteria for this systematic review (Fig. 1).

Data abstraction

Two independent reviewers (WT and ERL) critically evaluated the methodology and findings of the selected 28 studies. Data were extracted independently, and discrepancies in two papers were resolved by referral to the published data, discussion, and consensus (Blas et al., 2010; Cinciripini et al., 2000).

Results

Study characteristics

Twenty-eight studies were included for analysis in this systematic review. Twenty-four studies were conducted in the United States (Acierno et al., 2003; Albert et al., 2007; Armstrong et al., 2011; Avis et al., 2004; Calderon et al., 2007; Carey et al., 2008; Cinciripini et al., 2000; Collins et al., 2009; Eckman et al., 2012; Friedman et al., 2001; Frosch et al., 2003; Glasgow et al., 2009; Kulp et al., 2004; Lichtenstein et al., 2008; Partin et al., 2004; Powell & Edgren, 1995; Sanderson & Yopyk, 2007; Scheinmann et al., 2010; Solomon & DeJong, 1988; Taylor et al., 2006; Trent et al., 2010; Volk et al., 2003; Zapka et al., 2004; Zimmers et al., 1999), whereas the remaining four studies were performed in Austria (Janda et al., 2002), Peru (Blas et al., 2010), and the United Kingdom (Dyson et al., 2010; McAvoy & Raza, 1991). All studies were randomized controlled trials except three, one which used a prospective cohort design (McAvoy & Raza, 1991), another used a quasi-experimental model (Scheinmann et al., 2010), and the last used a hybrid preference/randomized controlled trial design (Glasgow et al., 2009). A non-randomized controlled trial was included in this review if significantly

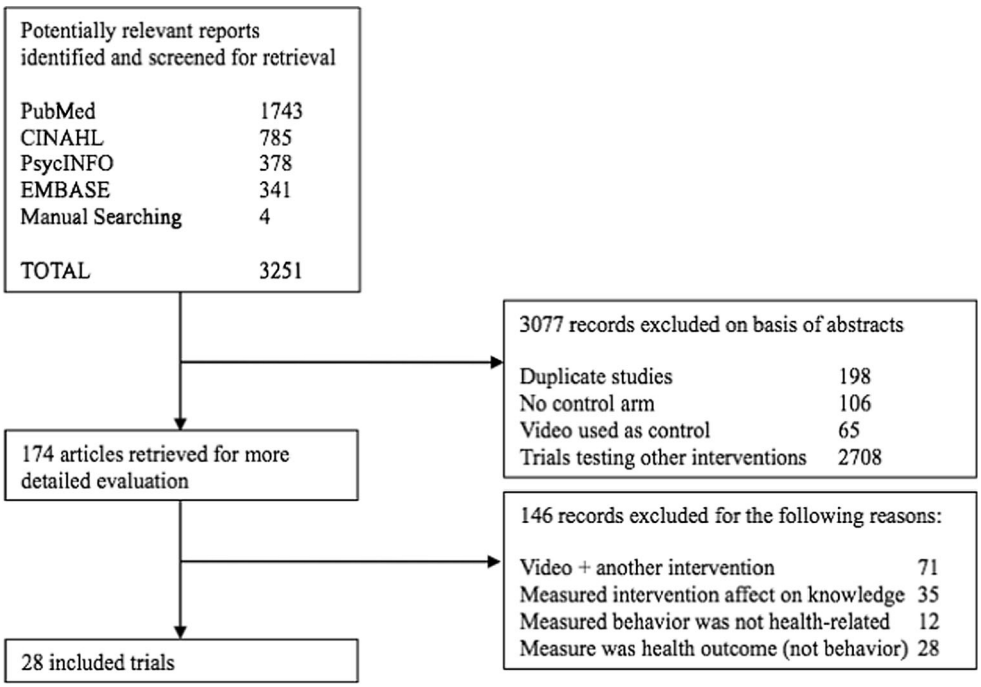

Fig. 1 Flowchart

different baseline characteristics were controlled for in final statistical models or analyses. Study populations ranged from 42 to 4,246 individuals. A summary of study characteristics is shown in Table 1.

Population characteristics

Twenty-one studies recruited participants from outpatient settings (Acierno et al., 2003; Armstrong et al., 2011; Avis et al., 2004; Calderon et al., 2007; Carey et al., 2008; Collins et al., 2009; Dyson et al., 2010; Eckman et al., 2012; Friedman et al., 2001; Frosch et al., 2003; Glasgow et al., 2009; Janda et al., 2002; Kulp et al., 2004; Lichtenstein et al., 2008; McAvoy & Raza, 1991; Partin et al., 2004; Powell & Edgren, 1995; Solomon & DeJong, 1988; Trent et al., 2010; Volk et al., 2003; Zapka et al., 2004), six studies enrolled participants from community or university settings (Blas et al., 2010; Cinciripini et al., 2000; Sanderson & Yopyk, 2007; Scheinmann et al., 2010; Taylor et al., 2006; Zimmers et al., 1999), and one study obtained subjects in an inpatient setting (Albert et al., 2007). While the majority of studies included participants who were 18 years or older, six studies worked primarily with adolescents and included individuals who were 14 years or older (Acierno et al., 2003; McAvoy & Raza, 1991; Sanderson & Yopyk, 2007; Solomon & DeJong, 1988; Trent et al., 2010; Zimmers et al., 1999). Thirteen studies included men and women (Albert et al., 2007; Armstrong et al., 2011; Calderon et al., 2007; Carey et al., 2008; Collins et al., 2009; Dyson et al., 2010; Eckman et al., 2012; Friedman et al., 2001; Glasgow et al., 2009; Lichtenstein et al., 2008; Powell & Edgren, 1995; Sanderson & Yopyk, 2007; Zapka et al., 2004), six studies enrolled only men (Blas et al., 2010; Frosch et al., 2003; Partin et al., 2004; Solomon & DeJong, 1988; Taylor et al., 2006; Volk et al., 2003), and nine studies included only women (Acierno et al., 2003; Avis et al., 2004; Cinciripini et al., 2000; Janda et al., 2002; Kulp et al., 2004; McAvoy & Raza, 1991; Scheinmann et al., 2010; Trent et al., 2010; Zimmers et al., 1999).

General intervention characteristics

Effectiveness of video education was compared to other non-video media. Seven studies compared video education to treatment-as-usual (Janda et al., 2002; Kulp et al., 2004; Powell & Edgren, 1995; Sanderson & Yopyk, 2007; Scheinmann et al., 2010; Solomon & DeJong, 1988; Zapka et al., 2004), eleven studies compared video education to a written materials (e.g., pamphlet or Internet-delivered written information) (Armstrong et al., 2011; Avis et al., 2004; Blas et al., 2010; Cinciripini et al., 2000; Eckman et al., 2012; Friedman et al., 2001; Frosch et al., 2003; McAvoy & Raza, 1991; Trent et al., 2010; Volk et al., 2003; Zimmers et al., 1999), eight studies compared video education to counseling (Acierno et al., 2003; Albert et al., 2007; Calderon et al., 2007; Carey et al., 2008; Collins et al., 2009; Dyson et al., 2010; Glasgow et al., 2009; Lichtenstein et al., 2008), and two studies compared the

Table 1 Study descriptions

Study identification	N	Age (years) Mean(SD)/ median (range)	Gender n (%)	Topic	Video study arm	Non-video study arm	Follow-up time points
Solomon and DeJong (1988) RCT—USA/ outpatient	902	23 (13–61)	902 (100) male	Treatment adherence in patients with gonorrhea	Video duration: NR Theory: health belief model Msg type: loss-frame	Usual care	None
McAvoy and Raza (1991) Prospective cohort—UK/Outpatient	323	NR (16–50)	737 (100) female	Cervical cancer screening with cervical smear test	Video duration: 5 min	Leaflet + fact sheet	4 months
Powell and Edgren (1995) RCT—USA/ outpatient	4246	Intervention: 54 (20–94) Control: 55 (20–97)	2811 (66.2) female	Medication compliance	Video duration: 30 min Msg type: gain-frame	Usual care	9 months
Zimmers et al. (1999) RCT—USA/ Community	100	13 (17–62)	100 (100) female	HIV prevention via female condom use promotion	Video duration: NR Teaching tool: video modeling	Written instructions on condom use	6 months
Cinciripini et al. (2000) RCT—USA/ Community	82	Intervention: 29.8 (5.5) Control: 31.2 (5.6)	82 (100) female	Smoking cessation	Video duration: 6 videos, 25–30 min each	Usual care + tip guide	2–3 days post-quit 4–5 weeks post-quit 1 month postpartum
Friedman et al. (2001) RCT—USA/ Outpatient	160	61 (7.24)	135 (84.4) female	Colorectal cancer screening with fecal occult blood test	Video duration: NR Theory: health belief model Msg type: gain-frame	Brochure	None
Janda et al. (2002) RCT—Austria/ outpatient	219	33.4 (11.2)	219 (100) female	Breast cancer screening with breast self exam	Video duration: 15 min Theory: theory of planned behavior Msg type: gain-frame Teaching tool: video modeling	Usual care	3 months
Acierno et al. (2003) RCT—USA/ Outpatient	226	25.4 (10.1)	226 (100) female	Substance abuse prevention	Video duration: 17 min	Face-to-face counseling	6 weeks
Frosch et al. (2003) RCT—USA/ Outpatient	226	Intervention: 61.85 (8.26) Control: 62.25 (9.31)	226 (100) male	Patient education regarding prostate cancer screening	Video duration: 23 min	Internet website	NA
Volk et al. (2003) RCT—USA/ Outpatient	160	Intervention: 58.9 (7.38) Control: 59.7 (7.75)	160 (100) male	Patient education regarding prostate cancer screening	Video duration: 20 min	Pamphlet	2 weeks and 1 year
Avis et al. (2004) RCT—USA/ outpatient	669	58.8 (NR)	669 (100) female	Breast cancer screening with mammography	Video duration: 23 min Theory: theory of planned behavior + Health belief model Msg type: gain-frame	Pamphlet	2 and 12 months
Kulp et al. (2004) RCT—USA/ outpatient	195	Intervention: 50.41 (NR) Control: 50.07 (NR)	195 (100) female	Osteoporosis prevention	Video duration: 10 min	Usual care	3 months
Partin et al. (2004) RCT—USA/ Outpatient	893	68.4 (NR)	1152 (100) male	Patient education regarding prostate cancer screening	Video duration: 23 min Theory: social cognitive theory	Pamphlet/usual care	1 week, 2 weeks and 1 year
Zapka et al. (2004) RCT—USA/ outpatient	938	50–64 years: 612 (65.2 %) ≥65 years: 326 (34.8 %)	530 (56.5) female	Colorectal cancer screening with sigmoidoscopy	Video duration: 15 min Theory: social Cognitive Theory Msg type: gain-frame	Usual care	6 months
Taylor et al. (2006) RCT—USA/ Community	294	56.0 (8.0)	294 (100) male	Patient education regarding prostate cancer screening	Video duration: 25 min	Print and Wait list control	1 month and 1 year

Table 1 continued

Study identification	N	Age (years) Mean(SD)/ median (range)	Gender n (%)	Topic	Video study arm	Non-video study arm	Follow-up time points
Albert et al. (2007) RCT—USA/Inpatient	112	Intervention: 59 (13.7) Control: 61 (14.2)	26 (23.2) female	Self-care in heart failure patients	Video duration: 60 min Teaching tool: Video modeling	Physician/Nurse education	3 month
Calderon et al. 2007 RCT—USA/Outpatient	404	Intervention: 28 (8.7) Control: 29 (9.3)	252 (62.4) female	HIV testing	Video duration: 10 min Msg type: gain-frame	Face-to-face counseling	30 days
Sanderson and Yopyk (2007) RCT—USA/Community (College)	220	19.6 (NR)	109 (49.5) female	HIV prevention via condom use promotion	Video duration: 2 videos, 30 min each Msg type: gain-frame	Usual care	4 months
Carey et al. (2008) RCT—USA/Outpatient	60	31.3 (9.3)	10 (16.7) female	HIV testing	Video duration: NR Msg type: gain-frame	Face-to-face counseling	None
Lichtenstein et al. (2008) RCT—USA/Community	1364	NR	NR	Smoking cessation	Video duration: 15 min	Telephone counseling	3 months and 12 months
Collins et al. (2009) RCT—USA/Outpatient	51	67.4 (8.9)	18 (40.9) female	Physical activity promotion in patients with peripheral arterial disease	Video duration: 7 min Msg type: loss-frame	Face-to-face counseling	12 weeks
Glasgow et al. (2009) RCT/Preference—USA/ Outpatient	155	Intervention: 63.4 (9.2) Control: 63.5 (9.2)	NR	Self-management behavior in patients with diabetes	Video duration: 4 h	Classroom instruction	6 months
Blas et al. (2010) RCT—Peru/Community	459	Intervention: Non-gay: 26.4 (NR) Gay: 26.9 (NR) Control: Non-gay: 26.2 (NR) Gay: 25.0 (NR)	259 (100) male	HIV testing	Videos duration: 5 min Theory: health belief model + transtheoretical model	Written information	None
Dyson et al. (2010) RCT—UK/outpatient	42	60.8 (9.6)	24 (57.1) female	Lifestyle changes in patients with type 2 diabetes mellitus	Videos duration: 3 videos, 10–15 min each	Physician education	6 months
Scheinmann et al. (2010) Quasi-experimental—USA/ community	439	29 (NR)	439 (100) female	Breastfeeding	Video duration: 25 min	Usual care	3 months and 6 months
Trent et al. (2010) RCT—USA/Outpatient	126	17.3 (1.7)	126 (100) female	Pelvic inflammatory disease	Video duration: 6 min Theory: health belief model Msg type: gain-frame	Written information	2 weeks
Armstrong et al. (2011) RCT—USA/Outpatient	94	Intervention: 34.7 (12) Control: 39.6 (14)	47 (50.0) female	Skin cancer prevention via sunscreen adherence	Video duration: NR	Pamphlet	3 months
Eckman et al., (2012) RCT—USA/outpatient	187	Intervention: 58.49 (NR) Control: 61.37 (NR)	104 (61.2) female	Lifestyle changes in patients with coronary artery disease	Video duration: 30 min	Booklet	6 months

HIV human immunodeficiency virus, *Msg* message, *NR* not reported, *RCT* randomized controlled trial, *SD* standard deviation, *UK* United Kingdom, *USA* United States of America

video group to both a treatment-as-usual group and written materials group (Partin et al., 2004; Taylor et al., 2006).

The majority of the studies used a single video as the sole educational tool. However, three studies created an educational program utilizing multiple videos (Cinciripini et al., 2000; Dyson et al., 2010; Sanderson & Yopyk, 2007). Further, not all studies specified video duration (Table 1). However, video duration ranged from 5-min to 4-h and averaged 36.2 min among studies that reported this information.

Targeted health behaviors

The targeted health behaviors differed significantly among the various interventions. Ten studies focused on cancer screening behavior modification for colorectal cancer (Friedman et al., 2001; Zapka et al., 2004), skin cancer (Armstrong et al., 2011), breast cancer (Avis et al., 2004; Janda et al., 2002), cervical cancer (McAvoy & Raza, 1991), or prostate cancer (Frosch et al., 2003; Partin et al., 2004; Taylor et al., 2006; Volk et al., 2003). Furthermore, three studies targeted modifying substance use behavior (Acierno et al., 2003; Cinciripini et al., 2000; Lichtenstein et al., 2008). Specifically, two studies advocated smoking cessation (Cinciripini et al., 2000; Lichtenstein et al., 2008), while the third study sought to prevent substance abuse in recent victims of sexual violence (Acierno et al., 2003). Moreover, five studies used video education to encourage lifestyle modifications (e.g., increase physical activity) for patients with chronic diseases like diabetes (Dyson et al., 2010; Glasgow et al., 2009), osteoporosis (Kulp et al., 2004), coronary arterial disease (Eckman et al., 2012), peripheral arterial disease (Collins et al., 2009), and heart failure (Albert et al., 2007). Other studies focused on preventing sexually transmitted diseases through condom use (Sanderson & Yopyk, 2007; Zimmers et al., 1999), HIV testing (Blas et al., 2010; Calderon et al., 2007; Carey et al., 2008), or timely treatment of sexually transmitted infections (Trent et al., 2010). Two studies targeted treatment compliance (Powell & Edgren, 1995; Solomon & DeJong, 1988). Finally, one study aimed to promote proper infant feeding (Scheinmann et al., 2010).

Framing, theory, and teaching tools

The video messages were conveyed through different framing techniques. Specifically, health education can be framed by focusing on loss, gain, or both (Bunge et al., 2010). Gain-framed messages focus on the advantages of complying with a certain recommendation or viewpoint. In contrast, loss-framed messages emphasize the disadvantages of non-compliance (O'Keefe & Jensen, 2007). The majority of studies included in this systematic review used gain-framed messages to promote behavior change (Table 1).

The development of the video's educational messages was guided by different theories. However, only eight articles reported which theory was used (Avis et al., 2004; Blas et al., 2010; Friedman et al., 2001; Janda et al., 2002; Partin et al., 2004; Solomon & DeJong, 1988; Trent et al., 2010; Zapka et al., 2004). These studies reported using one or a combination of theories, such as the Health Belief Model, Transtheoretical Model, theory of planned behavior, and/or social cognitive theory (Table 1). The Health Belief Model predicts that individuals are more likely to perform a health-related behavior if they believe that (1) a negative health condition can be avoided, (2) a recommended action is available to avoid a negative health condition, and (3) they can successfully take a recommended health action (Rosenstock, 1966). Alternatively, the Transtheoretical Model explains how individuals move along a continuum of motivational readiness when changing a problem behavior. Specific stages along this continuum are the pre-contemplation stage (individuals are unready or have no intention to change behavior), contemplation stage (individuals are aware of the problem and considering change), preparation stage (individuals intend to take action), action stage (individuals are modifying behavior), maintenance stage (individuals are working to prevent relapse), and termination stage (individuals no longer have fear of relapse) (Prochaska, 1979). Theory of planned behavior explains how behavioral intent is driven by (1) personal attitudes toward a behavior, (2) social pressures and norms surrounding the performance of a behavior, and (3) the perception of the ease with which a behavior can be performed (Ajzen, 1980). The social cognitive theory explains how an individual learns behavior by modeling the behavior of others (Bandura, 1986).

In addition, three studies reported the use of video modeling as a strategy to facilitate the learning of new behaviors and skills (Albert et al., 2007; Janda et al., 2002; Zimmers et al., 1999). Video modeling (also known as "role modeling" or "behavioral modeling") refers to the demonstration of desired behaviors though active, visual representations (Krouse, 2001).

Effect of video intervention on short-term health behaviors

Nine studies reported that video interventions resulted in significant changes in the targeted behaviors, such as breast self-examination, prostate cancer screening, sunscreen adherence, self-care in patients with heart failure, HIV testing, treatment compliance, and female condom use (Albert et al., 2007; Armstrong et al., 2011; Blas et al., 2010; Calderon et al., 2007; Carey et al., 2008; Frosch et al., 2003; Janda et al., 2002; Solomon & DeJong, 1988; Zimmers et al., 1999).

One study found that women assigned to the video group performed breast self-exams more frequently than those in the non-video group (Janda et al., 2002). Armstrong et al. (2011) found that video-group participants reported greater sunscreen adherence compared to the pamphlet-group. Frosch et al. (2003) noted that men who watched a patient education video on prostate cancer screening were less likely to obtain a prostate-specific antigen test compared to men who received the same information via an Internet website. Albert et al. (2007)

reported that heart failure patients in the video-group had greater self-care adherence compared to the group receiving standard education. Calderon et al. (2007) and Carey et al. (2008) found that HIV testing rate was higher in the video group than in the standard-referral group. Similarly, the study by Blas et al. (2010) found that non-gay men assigned to the video condition were more likely to attend clinic for HIV testing. Solomon and DeJong (1988) found that among men with gonorrhea, video participants were more likely to adhere to the recommended treatment regimen compared to participants who did no watch the video. Zimmers et al. (1999) described how women who watched video instruction on the female condom were more likely to use this barrier method to prevent HIV transmission.

While the aforementioned nine studies showed significant effect of videos on health behaviors, the majority of studies reported non-significant changes in health behaviors compared to the control group in at least one of the outcome parameters (Acierno et al., 2003; Avis et al., 2004; Cinciripini et al., 2000; Collins et al., 2009; Dyson et al., 2010; Eckman et al., 2012; Friedman et al., 2001; Glasgow et al., 2009; Kulp et al., 2004; Lichtenstein et al., 2008; McAvoy & Raza, 1991; Partin et al., 2004; Powell & Edgren, 1995; Sanderson & Yopyk, 2007; Scheinmann et al., 2010; Taylor et al., 2006; Trent et al., 2010; Volk et al., 2003; Zapka et al., 2004). A summary of these studies is shown in Table 2.

Effect of video intervention on long-term health behaviors

Two studies obtained repeated measures from participants at multiple time points to explore the effects of video intervention on sustained health behavioral change over time (Lichtenstein et al., 2008; Scheinmann et al., 2010). For example, while video education appears to be effective in sustaining smoking cessation up to 12 months, this impact was not significantly different from telephone counseling in maintaining quit rates (Lichtenstein et al., 2008). Scheinmann et al. (2010) found that, compared to standard treatment, the addition of video education did not significantly improve appropriate infant feeding behaviors among immigrant Latina mothers.

Methodological quality of studies and risk of bias

Numerous criteria were used to appraise the quality and risk of bias in the included studies (Table 3). Specifically, we recorded five aspects of the trials: (1) the presence of participant randomization, (2) randomization allocation concealment, (3) whether study arms were similar at baseline, (4) blinding, and (5) completeness of follow-up.

The majority of studies did not blind research staff (Table 3). Further, only five studies used concealed random allocation (Albert et al., 2007; Calderon et al., 2007; Collins et al., 2009; Dyson et al., 2010; Trent et al., 2010). All studies requiring participant follow-up noted varying degrees of participant dropout ranging from 2.1 to 47.9 % (Table 3). Nonrandom attrition between the intervention and control groups was noted in some studies.

Self-report bias relates to error in recalling experiences or the tendency of participants in clinical trials to respond in a socially desirable manner (Plous, 1993; Warwick & Lininger, 1975). While self-report bias was noted in the majority of studies, ten trials used objective means to measure or verify behavioral outcomes to minimize this bias (Cinciripini et al., 2000; Dyson et al., 2010; Eckman et al., 2012; Friedman et al., 2001; Frosch et al., 2003; McAvoy & Raza, 1991; Partin et al., 2004; Powell & Edgren, 1995; Solomon & DeJong, 1988; Zapka et al., 2004). For example, one smoking cessation trial verified abstinence reports through salivary cotinine values (<30 ng/ml) (Cinciripini et al., 2000). Other studies reviewed medical records to verify treatment or medication adherence (Powell & Edgren, 1995; Solomon & DeJong, 1988) or validate self-report of age-appropriate cancer screening (Friedman et al., 2001; Frosch et al., 2003; McAvoy & Raza, 1991; Partin et al., 2004; Zapka et al., 2004). Another study used a pedometer to measure changes in participants' physical activity level (Dyson et al., 2010). Additionally, weight and blood pressure were measured by one study to assess consistency with self-reported exercise levels and dietary modifications (Eckman et al., 2012).

Discussion

Video-based educational interventions have been used to promote specific preventive health behaviors that have the potential to decrease morbidity and mortality associated with certain diseases. To our knowledge, this is the first systematic review that examines effectiveness of video as a medium to promote health behavioral changes.

The studies examined in this review sought to compare effectiveness of video-based education to other educational modalities in promoting healthy behaviors. While some data suggest that video-based education can affect certain types of health behaviors, significant improvements in behavioral outcomes were not reported uniformly across all studies.

Several factors contribute to the observed differences among the studies. First, the selection of the control group differed among the studies. Studies that employed control groups that had intrinsic educational value (e.g., telephone counseling) are less likely to show a large difference in

Table 2 Study results

Author, year	Health behavior change outcome	Intervention results	Control results	Measures of association
Solomon and DeJong (1988)	Proportion who returned for treatment-of-cure	244 (53.5 %)	193 (43.3 %)	Intergroup: $\chi^2 = 9.0$, $p < .003$
McAvoy and Raza (1991)	Proportion who obtained cervical smear test	80 (30 %)	57 (26 %)	Intergroup: NS
Powell and Edgren (1995)	No. who were compliant with medication regimen	917/1993 (46 %)	998/2253 (44 %)	Intergroup: NS
Zimmers et al. (1999)	No. who used female condom	23	13	Intergroup: χ^2 (82) = 4.12, $p < 0.05$
Cinciripini et al. (2000)	Smoking abstinence proportion			Intergroup: NS
	Quit date	3 %	10 %	
	End of treatment	7.5 %	12 %	
	1 month postpartum	5 %	7.5 %	
	Continuous abstinence 1 month postpartum	5 %	7 %	
Friedman et al. (2001)	Proportion compliant with fecal occult blood testing use	48 (43.6 %)	18 (36.05)	Intergroup: $p = 0.07$
Janda et al. (2002)	Mean times breast self-exam performed per year			Adjusted follow-up BSE mean: Video arm: 7.9 (95 % CI 6.5–9.4) Control: 6.1 (95 % CI 4.6–7.5) Intergroup: $p = 0.02$
	Baseline	3.6/year	Baseline: 4.9/year	
	Follow-up	8.1/year	Follow-up: 7.2/year	
		Intragroup: $p < 0.001$	Intragroup: $p < 0.001$	
Acierno et al. (2003)	Proportion who reported			Intergroup
	Alcohol use	27 (45.0 %)	28 (44.4 %)	$p = 0.547$, OR: 1.02 (CI: NR)
	Alcohol abuse	10 (16.9 %)	13 (21.0 %)	$p = 0.371$, OR: 0.77 (CI: NR)
	Marijuana use	10 (16.4 %)	17 (27.4 %)	$p = 0.104$, OR: 0.519 (CI: NR)
	Marijuana abuse	3 (5.1 %)	10 (16.1 %)	$p = 0.046$, OR: 0.28 (CI: NR)
	Hard drug use	12 (19.7 %)	7 (11.3 %)	$p = 0.150$, OR: 1.92 (CI: NR)
	Hard drug abuse	3 (4.5 %)	3 (4.1 %)	$p = 0.661$, OR: 1.11 (CI: NR)
Frosch et al. (2003)	Proportion who requested prostate-specific antigen test			Intergroup
	Baseline	111/112 (99.1 %)	114/114 (100 %)	χ^2 (1) = 1.02, NS
	Posttest	88/108 (81.5 %)	102/111 (91.9 %)	χ^2 (1) = 4.61, $p < 0.05$
Volk et al. (2003)	Proportion who obtained			Intergroup
	Digital rectal exam	26/70 (37.1 %)	26/67 (38.8 %)	$p = 0.84$
	Prostate-specific antigen test test	24/70 (34.3 %)	37/67 (55.2 %)	$p = 0.01$
Avis et al. (2004)	Proportion who obtained mammogram			Odds ratio: video versus pamphlet: 1.475 (95 % CI 0.953–2.283), $p = 0.0811$ Mammogram within last year at follow-up of 12 months, video versus pamphlet: 82.0 versus 74.2 %, $p < 0.05$
	Within past year	Baseline: 217 (76.4 %)	Baseline: 215 (73.1 %)	
		Posttest: 230 (82.0 %)	Posttest: 218 (74.2 %)	
	1–2 years ago	Baseline: 37 (13.0 %)	Baseline: 49 (16.7 %)	
		Posttest: 28 (9.9 %)	Posttest: 54 (18.4 %)	
	> 2 years ago	Baseline: 20 (7.0 %)	Baseline: 20 (6.8 %)	
		Posttest: 16 (5.6 %)	Posttest: 13 (4.4 %)	
	Never	Baseline: 10 (3.5 %)	Baseline: 10 (3.4 %)	
		Posttest: 10 (3.5 %)	Posttest: 9 (3.1 %)	
Kulp et al. (2004)	Proportion who reported			Intergroup
	Started taking calcium	18 (26.5 %)	3 (4.9 %)	$p < 0.001$
	Started taking vitamin D	14 (20.6 %)	4 (6.6 %)	$p = 0.02$
	Started hormone therapy	8 (8 %)	1 (1 %)	$p = 0.04$
	Started lifting weights	8 (13.3 %)	1 (1.7 %)	$p = 0.03$
	Increased consumption of calcium rich foods to greater or equal than 3 times	10 (14.7 %)	4 (6.6 %)	NS

Table 2 continued

Author, year	Health behavior change outcome	Intervention results	Control results	Measures of association
	Increased physical activity to greater or equal to 3 times	7 (10.3 %)	1 (1.6 %)	NS
Partin et al. (2004)	Proportion who obtained a prostate-specific antigen test			Intergroup (versus usual care)
	Within 2 weeks	0.31	Pamphlet: 0.30	Video: NS
			Usual care: 0.25	Pamphlet: NS
	Within 1 year	0.70	Pamphlet: 0.70	Video: NS
			Usual care: 0.67	Pamphlet: NS
Zapka et al. (2004)	Proportion who obtained sigmoidoscopy with or without any other test	118 (26.2 %)	104 (21.3 %)	Odds ratio: 1.22 (95 % CI 0.88–17.0)
	Proportion who obtained other test combination	130 (28.9 %)	116 (34.0 %)	0.84 (95 % CI 0.63–1.14)
	Proportion who did not undergo screening/testing	202 (44.9 %)	218 (44.7 %)	1.0 (reference)
Taylor et al. (2006)	Percentage who obtained			Intergroup
	Digital rectal exam	65.9 %	77.0 %	NS
	Prostate-specific antigen test	72.4 %	77.9 %	NS
Albert et al. (2007)	Mean self-care scores (scale of 0–4, higher score reflects better adherence of participants who completed follow-up)	2.6	2.2	Intergroup: $p = 0.01$
Calderon et al. (2007)	Proportion who			Mean difference
	Agreed to HIV testing	187 (92.6 %)	9 (4.5 %)	88.1 (95 % CI 83.5–92.7)
	Returned for test results of those tested	57 (30.5 %)	8 (89.0 %)	−58.5 (95 % CI −80.0–36.8)
	Returned for test results of all patients in group	57 (28.2 %)	8 (3.9 %)	24.3 (95 % CI 17.5–31.0)
Sanderson and Yopyk (2007)	Proportion of protected intercourse	Male video		Male video (versus control)
		Male: 0.28 (0.07)	Male: 0.28 (0.07)	NS
		Female: 0.26 (0.07)	Female: 0.33 (0.07)	
		Female video		Female video (versus control)
		Male: 0.38 (0.07)		NS
		Female: 0.36 (0.07)		
	Proportion reporting condom use with last regular sexual partner*	Male video		Male video (versus control)
		Male: 77.8 %	Male: 40.0 %	χ^2 (1, N = 155) = 5.98, B = 1.27, $p < 0.01$
		Female: 50.0 %	Female: 45.9 %	
		Female video		Female video (versus control)
		Male: 62.5 %		χ^2 (1, N = 155) = 3.50, B = 0.94, $p = 0.06$
		Female: 50.0 %		
	Proportion reporting condom use condom use at last sexual encounter with new/casual partner*	Male video		Male video (versus control)
		Male: 76.5 %	Male: 76.5 %	NS
		Female: 100.0 %	Female: 68.4 %	
		Female video		Female video (versus control)
		Male: 85.7 %		NS
		Female: 76.9 %		
	Proportion reporting consistent condom use*	Male video		Male video (versus control)
	*n = 132	Male: 53.7 %	Male: 42.2 %	NR
		Female: 61.3 %	Female: 50.3 %	
		Female video		Female video (versus control):
		Male: 62.2 %		χ^2 (1, N = 155) = 3.19, B = 0.93, $p = 0.07$
		Female: 71.5 %		
Carey et al. (2008)	Proportion who obtained HIV test	6 (19 %)	13 (45 %)	χ^2 (1, N = 60) = 4.49, $p < .05$

Table 2 continued

Author, year	Health behavior change outcome	Intervention results	Control results	Measures of association
Lichtenstein et al. (2008)	Proportion who reported smoking cessation			Intergroup
	3 months	66 (7.3 %)	82 (9.1 %)	NS
	12 months	110 (12.2 %)	118 (13.1 %)	
	3 and 12 months	38 (4.2 %)	46 (5.1 %)	
	Proportion who reported smoking bans in household			Intergroup
	3 months	74 (15.3 %)	83 (17.0 %)	NS
	12 months	104 (21.4 %)	103 (21.15 %)	
	3 and 12 months	55 (11.3 %)	55 (11.3 %)	
Collins et al. (2009)	Activity level (SE)	Intragroup: mean change from baseline (SE)	Intragroup: mean change from baseline (SE)	Intergroup
	Distance	8.3 (5.9)	−1.9 (7.6)	
		$p = 0.17$	$p > 0.20$	$p > 0.20$
		NR (95 % CI −3.9–20.5)	NR (95 % CI −18.0–14.2)	NR (95 % CI −9.0–29.4)
	Speed	8.5 (4.1)	−3.9 (7.7)	
		$p = 0.05$	$p > 0.20$	$p = 0.17$
		NR (95 % CI 0.10–16.9)	NR (95 % CI −20.0–12.3)	NR(95 % CI −3.8–28.5)
	Stair climbing	1.0 (5.5)	7.6 (9.5)	
		$p > 0.20$	$p > 0.20$	$p > 0.20$
		NR (95 % CI −12.3–27.6)	NR (95 % CI −12.3–27.6)	NR (95 % CI −27.4 –14.1)
	Vigorous	8.0 (6.4)	5.6 (4.0)	
		$p > 0.20$	$p = 0.19$	$p > 0.20$
		NR (95 % CI −5.5–21.4)	NR (95 % CI −3.1–14.3)	NR (95 %CI −14.6–19.3)
	Light/moderate	−0.6 (3.0)	15.7 (11.0)	
		$p > 0.20$	$p = 0.18$	$p = 0.18$
		NR (95 % CI −7.1–5.9)	NR (95 % CI −8.8–40.3)	NR (95 %CI −37.0–4.3)
	Stretching	2.0 (1.6)	15.9 (8.7)	
		$p > 0.20$	$p = 0.09$	$p = 0.14$
		NR (95 % CI −1.3–5.2)	NR (95 % CI −3.0–34.7)	NR (95 %CI −28.2–0.04)
Glasgow et al. (2009)	Mean no. of healthy eating days per week (SD)			Intergroup: NS
	Baseline	4.0 (0.3)	4.6 (0.3)	
	Adjusted 6 month changes	−0.4 (0.1)	−0.4 (0.2)	
	Mean no. of physical activity days per week (SD)			Intergroup: NS
	Baseline	4.3 (0.3)	4.0 (0.5)	
	Adjusted 6 month changes	0.2 (0.2)	−0.1 (0.3)	
	Mean medication adherence score (SD)			Intergroup: $p < 0.05$
	Baseline	1.2 (0.04)	1.1 (0.3)	
	Adjusted 6 month changes	0.0 (0.02)	0.2 (0.04)	
	Mean times blood glucose tested per week (SD)			Intergroup: NS
	Baseline	5.0 (0.4)	5.1 (0.5)	
	Adjusted 6 month changes	0.1 (0.2)	0.1 (0.4)	
Blas et al. (2010)	Proportion obtained HIV test	Non-gay: 11 (11.3 %)	Non-gay: 0 (0.0 %)	$p = 0.001$
		Gay: 8 (5.6 %)	Gay: 10 (7.7 %)	NS
Dyson et al. (2010)	Mean steps per day (SD)	Intragroup	Intragroup	Intergroup
		Baseline: 6097 (3457)	Baseline: 5346 (3483)	$p = 0.063$
		Absolute changes from baseline at 6 months: +1266	Absolute changes from baseline at 6 months: −721	
		$p = 0.043$	NS	

Table 2 continued

Author, year	Health behavior change outcome	Intervention results	Control results	Measures of association
Scheinmann et al. (2010)	Proportion who reported			
	Any breastfeeding	Baseline: 85.3 %	Baseline: 89.1 %	NS
		3 month: 74.8 %	3 month: 76.7 %	NS
		6 month: 53.8 %	6 month: 58.9 %	NS
	Added cereal, sugar or honey to bottle	Baseline: 4.3 %	Baseline: 4.7 %	NS
		3 month: 16.8 %	3 month: 17.2 %	NS
		6 month: 28.7 %	6 month: 29.5 %	NS
	Put baby to bed with a bottle	Baseline: 11.2 %	Baseline: 7.0 %	NS
		3 month: 16.1 %	3 month: 17.1 %	NS
		6 month: 21.0 %	6 month: 23.3 %	NS
	Gave baby solid foods excluding cereal before 6 months	3 month: 44.4 %	3 month: 37.3 %	NS
		6 month: 49.6 %	6 month: 54.2 %	NS
	Gave baby juice before 6 months	3 month: 30.1 %	3 month: 28.9 %	NS
		6 month: 35.3 %	6 month: 39.7 %	NS
	Mean age at first solids	5.2 months	4.9 months	$p < 0.05$
	Mean age at first juice	5.8 months	5.5 months	NS
Trent et al. (2010)	Proportion who completed medications	23 (66 %)	27 (66 %)	NS
	Proportion who abstained from intercourse	25 (78 %)	31 (89 %)	NS
	Proportion who notified partner	30 (88 %)	35 (92 %)	NS
	Proportion of partners treated	24 (71 %)	20 (53 %)	NS
Armstrong et al. (2011)	Mean no. of days sunscreen applied per week (SD)	Intragroup:	Intragroup:	Intergroup analysis:
		Baseline: 1.7 (2.5)	Baseline: 2.0 (3.0)	Baseline: $p = 0.552$
		Posttest: 3.4 (2.6)	Posttest: 2.4 (3.0)	Intervention: 1.9 (2.3)
		$p < 0.001$	$p = 0.058$	Control: 0.2 (0.5)
				$p < 0.001$
Eckman et al. (2012)	Physical activity score (SD)	Baseline: 73.21 ± 49.96	Baseline: 69.35 ± 44.74	NR
		Follow-up: 77.73 ± 46.31	Follow-up: 71.70 ± 45.91	
		$p = 0.05$	$p = 0.11$	
	Diet score (SD)	Baseline: 48.46 ± 22.45	Baseline: 48.82 ± 25.40	NR
		Posttest: 41.40 ± 19.49	Posttest: 40.63 ± 21.75	
		$p < 0.0001$	$p < 0.0001$	

BSE breast self-exam, *HIV* human immunodeficiency virus, *No.* number, *NS* not significant, *NR* not reported, *SD* standard deviation, *SE* standard error

behavior outcomes when compared to video intervention. Second, specific strategies used in the development of the educational videos may have differed significantly among the different studies, therefore accounting for effect size of the intervention. For instance, the video intervention by Janda et al. (2002) sought to increase breast self-examination by showing a video footage of a woman performing breast self-examination while explaining her movements. Albert et al. (2007) used a similar technique to teach heart failure patients self-care behaviors whereas Zimmers et al. (1999) used this technique to teach women how to use the female condom. As mentioned before, this is a strategy called "video modeling" and refers to active and visual demonstrations of desired behaviors (Krouse, 2001). Furthermore, the effects of modeling can be enhanced when the video is racially, ethnically, linguistically, and/or culturally concordant with the target population (Steinke, 2001). Video modeling has been found to increase self-care behaviors in numerous studies and may be an important consideration in future video interventions (McDaniel & Rhodes, 1998; Mynaugh, 1991; Wood, 1996).

Interventions that targeted cigarette smoking or substance abuse were not able to consistently promote significant changes in behavior (Acierno et al., 2003; Cinciripini et al., 2000; Lichtenstein et al., 2008). The two smoking cessation trials by Cinciripini et al. (2000) and Lichtenstein et al. (2008) used standard video education methods and did not report significantly greater quit rates in the video group. Although the study by Acierno et al. (2003) found that patients in the video intervention were less likely to abuse marijuana, differences in alcohol use/abuse and hard drug use/abuse were non-significant. Health

Table 3 Risk of bias

Author, Year	Selection bias			Performance bias			Measurement bias	Attrition bias
	Randomization	Allocation concealed	Groups similar at baseline	Blinding of patients	Blinding of treating providers	Completeness of follow-up	Blinding of outcomes assessors	Intention to treat
Solomon and DeJong (1988)	Y	N	Y	NA	N	NA	N	NR
McAvoy and Raza (1991)	N	N	Y	NA	N	Intervention: 170/264 (64.4 %) Control: 153/219 (69.8 %)	N	NR
Powell and Edgren (1995)	Y	N	Y	N	N	Intervention: 2253/2253 (100 %) Control: 1993/1993 (100 %)	N	NR
Zimmers et al. (1999)	Y	N	Y	NA	N	Intervention: 28/50 (56 %) Control: 20/50 (40 %)	N	NR
Cinciripini et al. (2000)	Y	N	Y	NA	N	50/82 (61 %)	N	NR
Friedman et al. (2001)	Y	N	Y	NA	N	NA	N	NR
Janda et al. (2002)	Y	N	Y	NA	N	170/219 (77.6 %)	N	NR
Acierno et al. (2003)	Y	N	Y	NA	Y	Intervention: 61/117 (52.1 %) Control: 63/109 (57.8 %)	N	NR
Frosch et al. (2003)	Y	N	Y	NA	N	Intervention: 106/112 (94.0 %) Control: 94/114 (82.5 %)	N	Y
Volk et al. (2003)	Y	N	Y	NA	Y	Intervention: 70/80 (87.5 %) Control: 67/80 (83.8 %)	N	NA
Avis et al. (2004)	Y	N	Y	NA	N	Intervention: 285/331 (86.1 %) Control: 296/338 (87.6 %)	N	Y
Kulp et al. (2004)	Y	N	Y	NA	Y	Intervention: 68/98 (69.4 %) Control: 61/97 (62.9 %)	N	NR
Partin et al. (2004)	Y	N	Y	NA	Y	Video: 308/384 (80.2 %) Pamphlet: 295/384 (76.8 %) Usual Care: 290/384 (75.5 %)	N	NR
Zapka et al. (2004)	Y	N	Y	NA	Y	918/938 (97.8 %)	N	Y

Table 3 continued

Author, Year	Selection bias			Performance bias			Measurement bias	Attrition bias
	Randomization	Allocation concealed	Groups similar at baseline	Blinding of patients	Blinding of treating providers	Completeness of follow-up	Blinding of outcomes assessors	Intention to treat
Taylor et al. (2006)	Y	N	N	NA	N	Intervention: 77/139 (55.4 %) Control: 87/138 (63.0 %)	N	NR
Albert et al. (2007)	Y	Y	N	NA	Y	Intervention: 37/59 (62.7 %) Control: 39/53 (73.6 %)	N	Y
Calderon et al. (2007)	Y	Y	Y	NA	N	NA	N	NR
Sanderson and Yopyk (2007)	Y	N	Y	NA	N	188/220 (85.5 %)	N	NR
Carey et al. (2008)	Y	N	Y	NA	N	NA	N	NR
Lichtenstein et al. (2008)	Y	N	Y	NA	N	Intervention: 506/676 (74.8 %) Control: 491/677 (72.5 %)	N	Y
Collins et al. (2009)	Y	Y	Y	NA	N	Intervention: 26/29 (89.7 %) Control: 18/22 (81.8 %)	N	Y
Glasgow et al. (2009)	Y	N	Y	NA	N	NR	N	Y
Blas et al. (2010)	Y	N	N	NA	N	NA	N	NR
Dyson et al. (2010)	Y	Y	Y	NA	N	Intervention: 21/21 (100 %) Control: 18/21 (85.7 %)	N	NR
Scheinmann et al. (2010)	N	N	N	NA	N	272/439 (61.9 %)	N	NA
Trent et al. (2010)	Y	Y	Y	NA	N	Intervention: 36/61 (59.0 %) Control: 41/65 (63.1 %)	N	NR
Armstrong et al. (2011)	Y	N	Y	NA	N	Intervention: 43/47 (91.5 %) Control: 40/47 (85.1 %)	N	Y
Eckman et al. (2012)	Y	N	N	NA	N	170/187 (90.9 %)	N	NR

N no, *NA* not applicable, *NR* not reported, *Y* yes

behaviors that include a component of addiction, such as cigarette smoking or drug use, may necessitate different types of interventions that incorporate tailored counseling or creative video messaging techniques.

Message framing theory may also play a role in determining the effectiveness of videos. We found that among the nine studies that resulted in changes in behavior, four studies explained the type of messaging used. Three videos used gain-framing (Janda et al., 2002; Calderon et al., 2007; Carey et al., 2008;) whereas one video focused on loss (Solomon & DeJong, 1988). Of note, a previous meta-analysis on messaging noted that gain-framed messages were more persuasive than loss-framed messages in disease prevention interventions (O'Keefe & Jensen, 2007). Our

systematic review suggests that gain-framed messages may be more effective than loss-framing in promoting certain types of health behavior change.

Furthermore, three studies among the nine that significantly changed behavior specified which theoretical frameworks were used (Blas et al., 2010; Janda et al., 2002; Solomon & DeJong, 1988). The video created by Solomon and DeJong (1988) and Janda et al. (2002) used the theory of planned behavior whereas the Health Belief Model and Transtheoretical Model informed the video intervention used by Blas et al. (2010). However, other studies also used these theories and did not consistently demonstrate behavior change. In particular, Trent et al. (2010) used the Health Belief Model and Avis et al. (2004) used both the theory of planned behavior and the Health Belief Model. Our findings suggest that theoretical frameworks may be a smaller determinant of a video's effectiveness compared to other factors discussed in this systematic review, such as the target behavior, use of gain-framing, or the use of video modeling.

The results of this systematic review must be interpreted in the context of the primary literature. For each study, we examined potential biases that could help explain differences among studies. To varying degrees, the lack of concealment of randomization allocation, lack of blinding, self-reporting bias, and high rate of participant dropout in some studies could compromise the integrity of the study data.

Conclusion

This systemic review showed that, compared to other educational media, video interventions were variably effective for modifying health behaviors depending on the target behaviors to be influenced. Video interventions appear to be effective in breast self-examination, prostate cancer screening, sunscreen adherence, self-care in patients with heart failure, HIV testing, treatment adherence, and female condom use. However, videos have not shown to be effective in influencing addiction behaviors when they are not tailored. Compared to loss-framing, gain-framed messages may be more effective in promoting certain types of health behavior change. Moreover, video modeling may facilitate learning of new behaviors and can be an important consideration in the development of future video interventions.

Appendix

See Table 4.

Table 4 Database search strategies

Database	Search strings used
PubMed	("Health Education"[MeSH Terms] OR "Health Behavior"[MAJR] OR "Health Knowledge, Attitudes, Practice"[MAJR] OR "health promotion"[MeSH Terms] OR "Consumer Health Information"[MAJR]) AND ("Video recording/methods"[MAJR] OR video[Title/Abstract] OR DVD[Title/Abstract] OR VHS[Title/Abstract] OR video disc recording[Title/Abstract] OR video-based[Title/Abstract] OR digital video recording[Title/Abstract] OR digital video[Title/Abstract] OR Videotape[Title/Abstract] OR Videotape recording[Title/Abstract])
EBSCO CINAHL	1. MW health behavior
	2. MW health promotion
	3. MW patient education
	4. MW health education
	5. 1 or 2 or 3 or 4
	6. MW videorecording
	7. MW digital versatile disc
	9. TX video*
	10. TX digital video
	11. TX DVD
	12. TX VHS
	13. TX video-based
	14. TX video disc recording
	15. TX digital video recording
	16. TX videotape
	17. TX videotape recording
	18. 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17
	19. 5 and 18
ProQuest PsycINFO	(SU.EXACT.EXPLODE("Health Promotion") OR SU.EXACT.EXPLODE("Health Behavior") OR SU.EXACT.EXPLODE("Lifestyle Changes")) AND MJSUB("Digital Video") OR MJSUB("Videotapes") OR MJSUB("Videotape Instruction") OR all(video*) AND pd(19750101-20120901)
EMBASE	1. 'health behavior'/exp/mj
	2. 'health education'/exp/mj
	3. 'consumer health information'/exp/mj
	4. 1 or 2 or 3
	5. 'video disk'/exp/mj
	6. 'videorecording'/exp/mj
	7. 'videotape'/exp/mj
	8. 5 or 6 or 7
	9. 4 and 8

* use truncation, *MeSH* medical subject headings (previously assigned subject heading), *MW* word in subject heading, *TX* all text, *exp* explode, *mj* major index term

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