Sex Roles
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ORIGINAL ARTICLE

Sex Roles in Health Storylines on Prime Time Television: A Content Analysis

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Abstract This study examined the role of character gender in prime time television health portrayals. A content analysis of 1,291 health-related storylines from three spring seasons (2004–2006) of the ten most popular American television programs measured the frequency of male and female characters in prominent roles and how storylines differed with the sex of the ill or injured character. Our analyses revealed a significantly greater number of male characters. Moreover, storylines with a male ill or injured character were more serious in tone, more likely to take place in a medical setting, and had higher educational value. Proportionally, there were some similarities in storylines across the sexes, however, the absolute differences are striking and may have unfortunate effects on viewers.

Keywords Content analysis · Sex roles · Health storylines · Television · Gender

Introduction

Every week millions of Americans watch popular prime time medical shows like *Grey's Anatomy*, *ER*, and *House*. While viewers are likely watching these television programs for entertainment, research has shown that audiences may also be impacted by the health-related information depicted in medical dramas as well as other popular television shows. In fact, a majority of regular television viewers consider TV as their primary source of health information (Beck and Pollard 2001; Pollard and Beck 2000). Further, a growing body of evidence demonstrates that popular prime time TV programs provide a unique opportunity for the viewing public to learn health-related information and even modify their attitudes and behaviors (Brodie et al. 2001; Hether et al. 2008; Keller and Brown 2002; Sharf and Freimuth 1993; Sharf et al. 1996; Whittier et al. 2005).

As a communication medium, television may be particularly well-suited to convey health-related information. A wealth of prior research has shown that the modeling of behavior plays a pivotal role in behavior change. In research spanning 30 years, Bandura (1977, 1986, 2002, 2004) has conclusively demonstrated that individuals are far more likely to mimic a behavior that they have seen being performed than one that was recommended, but not demonstrated. But Bandura's work also suggests that not all models are equally effective. Rather, viewers appear more likely to mimic models—in this case, television characters—that they perceive to be similar to them.

There are several characteristics, such as age and ethnicity, which viewers may use to establish similarity to television characters. With regard to health-related storylines, one of the most salient dimensions that viewers may use to evaluate their similarity to models is gender. Indeed, several studies have proposed that health storylines might have a greater impact on viewers who are the same sex as the character experiencing the health issue (Singhal and Rogers 1999; Valente et al. 2007). One implication of these findings is that the gender representation of fictional characters in popular prime time television programs may have a dramatic impact on what viewers attend to, learn from, and mimic in these health depictions. Thus, the

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objectives of the present content analysis are to first examine the overall gender representation of characters in health storylines on popular American broadcast television programs, focusing on the differences in the frequency of men and women in prominent roles, such as the caregiver or the ill or injured character. Further, the study analyzes how health storylines differ based on the sex of the ill or injured character by examining variables such as the prominence of the storyline, its tone, setting, health outcome, health information, and educational value. These variables are theorized to contribute to the potential impact of these storylines by influencing viewers' opportunities for learning—and modeling—health behaviors.

Literature Review

Numerous studies have demonstrated that viewers learn health-related information from watching fictionalized television programs. For example, Sharf et al. (1996) found that viewers of an ovarian cancer storyline depicted on the dramatic program *thirtysomething* reported learning something new about ovarian cancer after watching the program. Similarly, Brodie et al. (2001) showed that exposure to brief depictions on both the human papilloma virus (HPV) and emergency contraception on the medical drama, *ER,* increased viewers' knowledge of these health issues. In a study of adolescent viewers of the sitcom *Friends,* Collins et al. (2003) found that one out of every ten young viewers reported learning something new about condoms. Likewise, Wilkin et al. (2007) found changes in knowledge related to breast cancer in viewers exposed to a breast cancer storyline in a Spanish telenovela, and Hether et al. (2008) found increases in knowledge about breast cancer gene mutations among viewers of both *ER* and *Grey's Anatomy* storylines that addressed the issue.

Not only does exposure to health information in a fictionalized format impact knowledge about various health issues, exposure has also been associated with attitude and behavior change. For example, Sharf et al.'s (1996) study of the ovarian cancer storyline on *thirtysomething* reported that 40% of viewers took some kind of action as a result of being exposed to the storyline and 32% of viewers came away with insights and new ways of thinking. Brodie et al. (2001) reported that 51% of regular *ER* viewers talked with family and friends about health issues depicted in the program, and approximately one in five regular *ER* viewers sought out additional health information after seeing a health storyline on *ER.* Further, one in seven viewers said that they spoke with a health care provider because of something they saw on *ER*. Similarly, Collins et al. (2003) found increased interpersonal communication following exposure to the *Friends*' "condom" episode with approximately one out of every five young viewers in their sample reporting having talked with an adult about the episode. Hether et al. (2008) also found a relationship between exposure to breast cancer storylines and viewers' self-reported behavior change, including a significant increase in scheduling a breast cancer screening as well as more positive attitudes toward preventive mastectomy.

Researchers have used the term "entertainment-education" to demarcate this area of research that examines how narratives delivered in an entertainment format can influence audience members' real-world knowledge, attitudes, and behaviors about an issue. Singhal and Rogers (2002) defined entertainment-education (EE) as "the intentional placement of educational content in entertainment messages" (p. 117). These scholars further described EE as a communication strategy that can be used to "disseminate ideas to bring about behavioral and social change" (Singhal and Rogers 2002, p. 117). In the public health arena, entertainment-education has been embraced as a cost-effective means to communicate health information in an engaging format to a mass audience (Brodie et al. 2001; Bouman 2002; Glik et al. 1999; Valente et al. 2007). Within the context of popular prime time programming in the United States, an audience of millions of rapt viewers is virtually guaranteed.

Another advantage of using an EE strategy over a traditional public health campaign is that the use of narratives can circumvent counterarguing and sustain attention longer than traditional 30-s radio and television public service announcements (Green and Brock 2000; Greenberg et al. 2004; Singhal and Rogers 1999; Slater 2002). EE programs have the advantage of being able to engage viewers in a health issue for both a much longer duration and in greater depth than traditional health campaigns (Greenberg et al. 2004; Piotrow and de Fossard 2004; Singhal and Rogers 1999). While many EE messages in US television programs are "one shot" exposures, there are other examples where a health storyline may continue over several episodes or even an entire season (e.g. Kennedy et al. 2004; Sharf et al. 1996; Valente et al. 2007; Whittier et al. 2005). The advantage of a storyline that spans several episodes is that "the message is repeated in multiple forms through various positive and negative role models who find themselves in different situations, and not in a singularly repetitive way" (Singhal and Rogers 1999, p. 211). Moreover, by having a health storyline carried out in numerous episodes over a period of time, an EE program can provide more comprehensive treatment of an issue (Greenberg et al. 2004).

The additive effects of health content in television programs are not limited to a single television series. Health-related information that is dispersed across several television programs has been associated with cumulative

audience effects. For example, the Harvard Alcohol Project (HAP) launched a media campaign in late 1988 designed to reduce drunk driving through the adoption of designated drivers. The campaign received extensive support from the television industry and campaign messages were inserted into more than 160 entertainment television programs. Results from initial surveys showed a 10% increase in respondents who reported that they used a designated driver all or most of the time (Winsten and DeJong 2001). Similarly, Hether et al. (2008) examined the impact of two separate breast cancer storylines that appeared in *ER* and *Grey's Anatomy* approximately 3 weeks apart. Their findings showed that, while each storyline was modestly effective individually, combined exposure from viewing both storylines seemed to be most effective in changing viewers' relevant attitudes and actions. Together, these studies suggest that repeated exposure to the same health topic over time may result in an additive effect. Thus, it follows that health issues that are depicted frequently, even on different programs, may produce more change in viewers than those that are rarely depicted.

It is important to note, however, that the inclusion of health information in television programs is a necessary, but not a sufficient, condition to influence the knowledge, attitudes and behavior of viewers. A crucial element that mediates audience impact is the particular character at the center of the storyline. As mentioned previously, according to Bandura's social cognitive theory (1977, 1986, 2002), individuals are more likely to model the behavior of others they perceive to be similar to themselves. Seeing someone similar to oneself overcome obstacles and succeed in the face of adversity enhances individuals' beliefs in their own abilities—or self-efficacy—with regard to a particular behavior. Importantly for present purposes, Bandura (1997) suggests that models of the same gender are viewed as more credible and instill stronger efficacy beliefs and behavioral intentions than do models of a different gender. Feelings of similarity to a model contribute to viewers' identification with that model, a broader concept that may also include feelings of liking and wanting to be like a particular character (Kincaid 2002; Slater 2002). Identification, in turn, has been shown to be an important mediator of message effects (Papa et al. 2000; Rogers et al. 1999; Sood 2002; Valente et al. 2007; Wilkin et al. 2007). Slater and Rouner (2002) suggest that identification may partially mediate the effects of absorption in a narrative. These researchers suggest that identification, or "experienced similarity" (p. 178), to a character is dependent upon absorption in a narrative. Therefore, narratives with a protagonist who is perceived to be similar to viewers may be more influential with respect to viewers' knowledge, attitudes, and behavior simply because they are paying more attention not only to that specific character but to the overall storyline in which that character appears.

Because audience members tend to identify more strongly with characters of the same sex, gender is an important predictor of identification (Basil 1996; Singhal and Rogers 1999; Valente et al. 2007). As a consequence, the same fictional storyline may impact male and female viewers very differently. The current study examines the landscape of gender representation in popular prime time television. First, we examine differences with respect to both the relative frequency and the roles played by male and female characters in health storylines. Examining differences at this level may indicate how much opportunity male and female viewers have to identify with prominent characters in health storylines. Next, we analyze specific differences in health storylines based on the sex of the ill or injured character. Characters shown experiencing an illness, injury, disease or medical condition may provide a unique opportunity for the modeling of health-related attitudes and behaviors, particularly to viewers who identify with them. Thus, we examine variables such as the health outcome and the educational value of the health information associated with the sex of the ill or injured character to better understand their potential impact on male and female viewers.

The current study, therefore, adds to the existing literature by providing an assessment of the relative frequency of health depictions featuring male and female characters in the most popular prime time television programs. Whereas prior research has demonstrated that health storylines can impact the knowledge, attitudes, and behavior of viewers, and that gender may mediate the effects of such storylines, the current study examines the potential impact of health storylines by exploring how gender is associated with health depictions on prime time television.

Two research questions guided this study.

RQ1: Are there significant differences in the relative and absolute frequency of male versus female characters occupying prominent roles in health storylines?

RQ2: Are there significant differences in health storylines when the ill or injured characters are female as opposed to male? Specifically, are there differences in:

a. the prominence;
b. the tone;
c. the setting;
d. the type of health issue;
e. the health outcome;
f. the health information conveyed; and
g. the educational value of the health storylines?

Method

Sample

Since 2003, USC's Annenberg School for Communication, in collaboration with Hollywood, Health & Society, a program of the Annenberg Norman Lear Center, has been conducting the Television Monitoring Project, a research project that tracks the health content depicted on the most popular prime time television programs. Each spring season, roughly from January to May, the most popular scripted television programs are coded for health content. Each year the sample is created based on annual ratings data from Nielsen Media Research, and is restricted to programs airing on the five major broadcast networks (ABC, NBC, CBS, FOX, and CW—formerly UPN). The current analysis examined the health content on the ten most popular prime time television programs watched by Nielsen's 18–49-year-old General Audience from the years 2004–2006 (Table 1). The sample includes 1,291 separate health storylines that aired in 392 episodes across these three television seasons.

Instrument

There were two code sheets for this content analysis. The first, the "general" code sheet, was used to track health information and demographic variables on a general level, with the entire episode as its unit of analysis. This code sheet was used to capture demographic data, such as the ethnicity, gender and age of the major characters; the frequency and prominence (visual cue, brief mention, dialogue, minor or major storyline) of each health issue depicted; whether there were access to care issues; violence; and foods or beverages depicted or consumed in the episode. The major part of this code sheet focused on tracking which health issues were depicted in each episode. To do so, the instrument lists 65 health issues, ranging from the common cold, to diseases such as lung cancer and heart disease, to unusual illnesses such as small pox and toxic substance exposure, as well as other health issues such as accidental injuries and violence. Health depictions that did not fit into one of the predetermined categories were coded in an open-ended "other" category, thus ensuring that all health issues were captured.

The second code sheet, the "specific" code sheet, was used to track more detailed health information, with each health storyline as its unit of analysis. If a health issue was depicted at the level of a dialogue, minor or major storyline, then it was classified as a "health storyline" and the health content relating to that depiction was then coded with a specific health code sheet. The specific health code sheet tracked variables such as the health outcome; the health prominence; the setting; the type of health information presented; the educational content; and the demographic characteristics of the four most prominent characters in that storyline.

Table 1 Most popular prime time television shows 2004–2006.

General audience	2004	2005	2006
24		✓	✓
CSI	✓	✓	✓
CSI: Miami	✓	✓	✓
Desperate Housewives		✓	✓
ER	✓	✓	✓
Everybody Loves Raymond	✓		
Friends	✓		
Grey's Anatomy			✓
House		✓	✓
Law & Order	✓		
Law & Order: CI	✓		
Law & Order: SVU			✓
Lost		✓	
Medium		✓	
My name is Earl			✓
The Simpsons		✓	
That 70s Show	✓		
Will & Grace	✓		
Without a Trace	✓	✓	✓

Definitions

For the purpose of this project, a health issue was defined as "something dealing with disease, injury or disability." This definition is broader than what may commonly be considered a "health issue" since it includes such things as unintentional injury, violence, and mental health, in addition to topics more commonly considered "health problems" such as heart disease and cancer. We also coded lifestyle health issues such as nutrition and exercise depictions, as well as tobacco use. In short, our goal was to track a wide variety of depictions related to the health of the human body found in popular prime time television.

Health issues that rose to the level of a dialogue or above were considered "health storylines." A dialogue was defined as when a character verbally addressed an issue in three or more sentences in a single scene. A minor storyline was a storyline played out in two or three scenes and was of secondary importance to the plot and a major storyline was played out in more than three scenes and was of primary importance to that particular episode.

The four most prominent characters in each health storyline were also recorded. Once these characters were identified, they were then categorized into the appropriate

health role, which consisted of the following five categories: (1) caregiver (in a hospital setting this included doctors, nurses, or other health care providers, but it also included family members or friends who may have assumed this role, especially in non-medical settings); (2) ill or injured (the character who was afflicted with the health issue); (3) bystander (may have included friends or family of the ill or injured or witnesses to a violent health issue such as a homicide); (4) person who caused the illness or injury (could be a person who committed a violent health issue or someone who spreads an infection); and (5) unable to tell (someone whose role was unspecified or difficult to judge). With each of these characters, the coders recorded their gender, age, ethnicity, socio-economic status, health influence, and whether they were a regular or guest character.

We also examined the associations between seven additional dependent variables and the sex of the ill or injured character. Additional variables of interest included: (1) the health prominence of the storyline; (2) the tone of the health issue portrayal: (3) the setting; (4) the health issue; (5) the health outcome; (6) the type of health information; and (7) the storyline's educational value. See Table 2 for a complete description of these variables and their coding categories.

Data Collection

The sample was defined by ratings data collected by Nielsen Media Research from the November sweeps period (a peak period of audience measurement that is used by networks to set advertising rates and make programming decisions) immediately preceding each spring coding season. From this ratings data, the initial sample of ten shows was established and these shows were recorded at the beginning of the spring season for analysis. However, to ensure that our sample would include the most popular shows from the spring season (and not the fall when we established our initial sample), we also recorded new shows that were receiving a lot of media attention and had the potential to rank in the top 10 during the spring. The final sample of shows was then confirmed from data derived

Table 2 Variables of interest.

Variable	Definition	Coding categories
Health prominence of storyline	The extent of the depiction.	*Dialogue*: Three or more sentences of dialogue in one scene. *Minor storyline*: Played out across two or three scenes. *Major storyline*: Played out in more than three scenes and of primary importance to the particular episode.
Tone	The level of seriousness of the depiction.	*Comic*: the issue was portrayed in a joking or sarcastic manner and treated with little or no significance. *Casual*: the issue was spoken or acted upon in passing with no major consequential effects. *Serious*: the issue was portrayed seriously by the characters and may have included serious implications.
Setting	The location where the majority of the storyline took place.	*Home; work; school; healthcare setting; street/outdoors; mixed; other.*
Health issue	Something dealing with disease, injury or disability.	More than 65 health issues were coded, along with an option to include other, more unusual conditions.
Health outcome	The ill or injured character's health status at the conclusion of the episode.	*Died or declined; unchanged; improved; unclear; other.*
Type of health information	The presence of seven different kinds of health information.	*Prevention*: how the disease/injury could be prevented. *Risk factors*: pre-disease factors that make an individual more susceptible to the health issue, such as age, lifestyle, gender, etc. *Symptoms*: evidence of disease/injury. *Diagnosis*: the act of identifying a disease from its signs and symptoms. *Treatment*: medical course of action. *Complications*: unexpected occurrence of a secondary health problem. *Prognosis*: probable health outcome.
Educational value	How much information viewers get from the storyline.	*None.* *Weak*: vague, brief, or incomplete portrayal of the health issue. *Moderate*: addressed some primary messages about the health issue, but not necessarily very comprehensive information. *Strong*: very clear, comprehensive portrayal of the health issue.

from Nielsen's February sweeps ratings, and adjustments were made as needed. Occasionally, ratings plunged and some shows were dropped from network schedules, while others were added. Adjusting the final sample ensured that the data collected were from the most popular shows of that particular spring season.

Each year the sample included the highest-rated television programs for the 18–49 age group. The 18–49 age group was selected because approximately half of all prime time television viewers are in this age group and it is the demographic that advertisers typically target when buying air time. Constructing our sample based on the viewing habits of this age group ensured that the shows that we analyzed had the largest audiences and, consequently, the greatest potential impact.

Each spring six students were recruited from a graduate empirical research class to participate in the project as coders. Prior to content analyzing the programs, the coders were trained through an in-depth tutorial on all the coding items followed by several coding exercises. Further, each coder independently viewed and coded 4 h of TV shows (that were not part of the final sample), and discussions were held to go over any coding discrepancies, and to further establish coding protocol and definitions.

Each coder content analyzed approximately two to three programs weekly for the duration of the season. The content analysis was a two-step process: first, coders watched the episode in its entirety, without coding the content, then the coders watched the episode a second time and coded it using the instruments. Watching the episodes twice ensured that the coders wouldn't be "swept away" by the episode's narrative as they were trying to code it; in addition, coders could more easily analyze the health storylines on the second viewing now knowing the final health outcome. All episodes were coded with the general coding sheet. The second coding sheet, the "specific coding sheet," was only used for episodes that had health content at the level of a dialogue or greater. Therefore, many episodes had no specific code sheets associated with it, while other episodes had several specific code sheets. For example, a comedy program like *Everybody Loves Raymond* may not contain any health-related storylines, and hence would have no specific code sheets. However, a show like *ER* would have several specific code sheets describing all of the health issues that were addressed in the episode at the level of a dialogue or greater.

Reliability

We assessed inter-rater reliability by having the project manager, who had been with the project several years and had once been a coder herself, serve as a second coder on a random subset of shows—approximately 10%. Reliability was calculated between the project manager (who represented the "gold standard" of coding) and each coder on a stratified random sample of shows, ensuring that each program underwent reliability coding. Reliability was computed with simple percent agreement, one of the most popular coefficients of reliability, because of its ease of understanding (Neuendorf 2002; Rourke et al. 2001). Simple percent agreement was computed for each variable by dividing the number of times the project manager and the coder agreed on that variable by the total number of judgments.

While Cohen's kappa and Scott's pi are also popular reliability coefficients, they have been criticized as being too conservative (Neuendorf 2002). More specifically, these coefficients are problematic in the case of extreme distributions where a high percent agreement may equate to a low Cohen's kappa or Scott's pi (Perrault and Leigh 1989; Potter and Levine-Donnerstein 1999 as cited in Neuendorf 2002). This particular criticism was relevant for several variables in our study, and proved to be especially problematic for one variable. Therefore, while percent agreement is most illustrative of the reliability of this sample, because of its popularity, Cohen's kappa will also be reported with one exception detailed below.

In our analyses, Cohen's kappa was especially problematic for determining the reliability of the presence of health issues in our sample of TV programs. This variable was a poignant illustration of the paradox that Feinstein and Cicchetti (1990) discuss wherein a variable with high percent agreement results in a low Cohen's kappa due to the fact that kappa is affected by the prevalence of the variable under examination. In our reliability sample, many health conditions were not frequently depicted; therefore, in calculating Cohen's kappa the marginal totals were often unbalanced, but fairly symmetrical—a situation which reduces kappa. As Viera and Garrett (2005) explain, "kappa may not be reliable for rare observations" (p. 362). Therefore, for this variable (# 6 below) kappa was especially misleading; hence, we do not include it.

Reliability between the coders on each variable was as follows: (1) health role (percent agreement=94%, kappa=.77); (2) gender of prominent characters (percent agreement=100%, kappa=1.00); (3) health prominence (percent agreement=94%, kappa=.90); (4) tone (percent agreement=94%, kappa=.85); (5) setting (percent agreement=77%, kappa=.71); (6) health issues (dialogue +) (average percent agreement=98%); (7) health outcome (percent agreement = 94%, kappa=.92); (8) type of health information (percent agreement=87%–100%, kappa=.73–1.00); and (9) educational value (percent agreement=97%, kappa=.95).

Our initial sample of shows contained 515 episodes. That is, there were 515 unique episodes of the ten most popular prime time shows that aired during the years

2004–2006. Of this sample, 392 episodes contained at least one health storyline. Unitizing reliability was 100% for agreement on which episodes contained health storylines. In all, there were 1,291 health storylines that aired across these 392 episodes. Unitizing reliability of the health storylines was 82% agreement. Unitizing reliability for the four most prominent characters ranged from 81–100%. It was highest for the most prominent character, which was generally the ill or injured character. The average unitizing reliability of the four most prominent characters was 93% agreement.

Results

The following results focus on the 1,291 health storylines that aired on the top ten programs watched by the General Audience over the spring seasons of 2004–2006 (Table 1).

RQ1: *Gender Representation by Role*

For each storyline coders coded the four most prominent characters and then identified them as one of the following: 1) caregiver; 2) ill or injured; 3) bystander; or 4) person who caused the illness or injury. Of the 3,702 characters that played significant roles in health storylines, 62% of them were male (2,305 versus 1,397, χ^2 (1)=222.70, $p<.001$). Further, multiple sample chi-square tests for each character category showed that there were significantly more males than females in each of these roles (Table 3). Our findings show that male characters comprised 60% of the caregivers; 57% of the ill or injured; 62% of the bystanders; and 80% of the characters that caused the illness. The relative differences in the proportion of characters assuming each role are significant at the .05 level for each category, except the ill or injured role, where the proportional difference is not significant. Interestingly, the greater proportion of male characters on television does not reflect their true prevalence in the population. The US Census (2000) records the US population as being 49% male and 51% female.

RQ2a, b, c: *Storyline Prominence, Tone, and Setting*

Approximately half of all the health storylines in this sample were major storylines. This indicates that viewers were exposed to a large amount of health content, a suggestion that is further supported by the finding that three out of four prime time episodes (76%) contained at least one health storyline. As Table 4 indicates, there were significantly more male ill or injured characters depicted in both dialogues and minor storylines. Interestingly, however, a similar relative percentage of male and female characters starred in each kind of depiction (dialogue, minor storyline, major storyline). Within each level of storyline prominence, there was one significant difference found related to minor storylines: significantly more minor storylines featured a male ill or injured character as opposed to female (60% versus 40%, χ^2 (1)=4.00, $p<.05$).

More health storylines with male ill or injured characters were serious in tone, as opposed to being comic or casual, than those that featured female ill or injured characters (662 serious storylines for male characters versus 503 for female characters, χ^2 (1)=21.70, $p<.001$). Once again, however, proportionately there was no difference between the sexes: 91% of all storylines with male ill or injured and 91% of all storylines with female ill or injured characters were serious in tone.

There were also significantly more health storylines with male ill or injured characters set in healthcare settings (287 versus 224, χ^2 (1)=7.77, $p<.01$), on the street or outdoors (67 versus 28, χ^2 (1)=16.00, $p<.001$), and in mixed locations (200 versus 145, χ^2 (1)=8.77, $p<.01$). There were no significant differences between the sexes in storylines that were set in the home or at work or school. Proportionally, a significant difference was found in the depiction of storylines that occurred on the street or outdoors. Seventy-one percent of all the storylines that

Table 3 Gender distribution across four prominent roles.

	Male			Female			Total (across category)
	Freq	% within sex	% within category	Freq	% within sex	% within category	
Caregiver	613_b	26	60_b	401_a	29	40_a	1014
Ill or injured	732_b	32	57	554_a	40	43	1286
Bystander	552_b	24	62_b	340_a	24	38_a	892
Person who caused illness	408_b	18_b	80_b	102_a	7_a	20_a	510
N	2305_b			1397_a			3702

Frequencies or percentages with different letter subscripts in the corresponding columns for males and females differ significantly at the level of at least $p<.05$ using multiple sample chi square tests.

Table 4 Prominence of health storyline associated with sex of ill or injured character.

	Male			Female			Total (across category)
	Freq	% within sex	% within category	Freq	% within sex	% within category	
Dialogue	183_b	25	59	128_a	23	41	311
Minor storyline	218_b	30	60_b	143_a	26	40_a	361
Major storyline	326	45	54	281	51	46	607
N	727			552			1279

occurred outdoors had male characters versus only 29% of those with female characters (χ^2 (1)=17.64, $p<.001$).

RQ2d: *Specific Health Issues*

As shown in Table 5, six out of the ten most common health issues for males and females were the same; however, their frequency and relative importance varied by sex. The ten most common health issues that confronted both male and female characters included homicide; unusual illnesses; unintentional injury; motor vehicle related accidents; heart disease; and mental health. Male characters, however, were more often depicted as confronting illegal substance abuse issues; toxic substance exposure; falls; and prescription medication abuse, while female characters dealt with pregnancy related issues; rape/sexual assault; cancer; and alcohol abuse.

Table 5 Ten most common health issues for male and female characters.

Rank	Health issue	*Freq*	*% within sex*
Males			
1	Homicide	245	33
2	Unusual illness/disease	107	15
3	Unintentional injury	43	6
4	Motor vehicle related	37	5
5	Illegal substance abuse	30	4
6	Heart disease	28	4
7	Mental health	23	3
8	Toxic substance exposure	22	3
9	Unintentional falls	20	3
10	Prescription medication abuse	19	3
N		732	
Females			
1	Homicide	151	27
2	Unusual illness/disease	89	16
3	Pregnancy related	47	9
4	Rape/sexual assault	29	5
5	Unintentional injury	23	4
6	Mental health	22	4
7	Cancer	21	4
8	Motor vehicle related	21	4
9	Heart disease	16	3
10	Alcohol abuse	14	3
		554	

RQ2e: *Health Outcomes*

Somewhat paradoxically, a significantly greater number of male characters both died and improved in the health storylines in our sample. Proportionally, however, these differences were not significant: 37% of male characters and 34% of female characters died, while 26% of male characters and 24% of female characters improved (Table 6).

RQ2f: *Health Information*

Health information typically includes information about prevention; risk factors; symptoms; diagnosis; treatment; complications; and prognosis. In our sample of health storylines, there was consistently more health information presented when there was a male ill or injured character than a female character. As shown in Table 7, of the seven types of information we assessed, these differences were significant for five of them. Significantly more health storylines with male ill or injured characters contained prevention information (56 versus 37, χ^2 (1)=3.88, $p<.05$); risk factors (191 versus 146, χ^2 (1)=6.01, $p<.01$); symptoms (419 versus 336, χ^2 (1)=9.12, $p<.01$); diagnosis (320 versus 263, χ^2 (1)=5. 57, $p<.05$); and treatment information (322 versus 248, χ^2 (1)=9.61, $p<.01$). Proportionally, there were no significant differences within each sex; however, across the information categories, of all the prevention information depicted, there was significantly more when the ill or injured character was male, as opposed to female: (60% versus 40%, , χ^2 (1)=4.00, $p<.05$)

RQ2g: *Educational Value*

There were significantly more storylines with male ill or injured characters that contained moderate to strong health information as compared to those featuring female characters (361 versus 269, χ^2 (1)=13.43, $p<.001$). As Table 8 shows, while the overall percentages are similar—49% of storylines

Table 6 Health outcome associated with sex of ill or injured character.

	Male			Female			Total (across category)
	Freq	% within sex	% within category	Freq	% within sex	% within category	
Character dies	273_b	37	59	189_a	34	41	462
Character declines	84	12	55	70	13	45	154
Unchanged	125	17	51	118	21	49	243
Improves	189_b	26	59	132_a	24	41	321
Unresolved	27	4	61_b	17	3	39_a	44
NA/Unclear	18	2	51	17	3	49	35
Other	13	2	59	9	2	41	22
N	729			552			1281

with male ill or injured characters and 49% with female ill or injured characters contained moderate to strong health information—viewers overall were exposed to more moderate to strong health information about male ill or injured characters relative to female characters. Interestingly, a greater absolute number of storylines with no health information also featured male characters although the relative percentage was the same (238 or 33% for male characters in storylines with no health content versus 174 or 32%, χ^2 (1)=9.94, $p<.01$) for storylines featuring female characters. There were no significant differences associated with differences in the depiction of weak educational content.

Discussion

The goal of this study was to examine the gender landscape of health storylines that air on popular prime time television programs and to assess whether there are differences in storylines associated with the sex of the primary character. To do this, we content analyzed a sample of 1,291 health storylines across 392 episodes of the most popular prime time television programs over three consecutive spring television seasons. The study was guided by two research questions. The first research question asked whether there are significant differences in the absolute and relative frequency of male versus female characters occupying prominent roles in prime time health storylines while the second research question involved a comparison of the content of health storylines featuring males versus females.

In answer to the first of these research questions, our analysis supports the assertion that women may be receiving less health-related benefits from watching popular prime time programming. Females were significantly less likely to be featured as prominent characters in health storylines. Indeed, males dominated every prominent role associated with health storylines: there were more males who were caregivers; ill or injured characters; bystanders; and persons who caused the illness or injury. This disparity in popular depictions is not inconsequential. For example, such an imbalanced role representation of medical professionals might subtlety dissuade female viewers from pursuing healthcare-related occupations. Moreover, since prior research suggests that viewers may be more likely to identify with a same-sexed character, then an unequal gender representation may mean that viewers of one sex are less likely to attend to crucial health information and model the

Table 7 Health information associated with sex of ill or injured character.

	Male (*N*=732)			Female (*N*=554)			Total (across category)
	Freq	% within sex	% within category	Freq	% within sex	% within category	
Prevention	56_b	8	60_b	37_a	7	40_a	93
Risk factors	191_b	26	57	146_a	26	43	337
Symptoms	419_b	57	55	336_a	61	45	755
Diagnosis	320_b	44	55	263_a	47	45	583
Treatment	322_b	44	56	248_a	45	44	570
Complications	135	18	54	116	21	46	251
Prognosis	104	14	57	80	14	43	184

Table 8 Educational content associated with sex of ill or injured character.

	Male			Female			Total (across category)
	Freq	% within sex	% within category	Freq	% within sex	% within category	
None	238_b	33	58	174_a	32	42	412
Weak	130	18	56	102	19	44	232
Moderate–strong	361_b	49	57	269_a	49	43	630
N	729			545			1274

attitudes and behaviors associated with a health storyline. Following Bandura's framework of social modeling (1977, 1986, 2002, 2004), if there are more characters of one sex featured as the primary subjects of health storylines—namely the ill or injured character—then viewers of that sex may receive disproportionate health advantages.

To address our second research question we examined specifically how the content of health storylines varied as a function of the sex of the ill or injured character. These characters are typically at the center of health storylines and provide accessible models for the general public. Our analyses revealed that not only were there more male ill or injured characters overall, there were significantly more males depicted at each level of storyline prominence: males were at the center of more dialogues, more minor and more major storylines.

There were also more health storylines with male ill or injured characters that were serious in tone, as opposed to comic or casual. Since more health storylines with a male ill or injured character were serious in tone, it is not surprising that our content analysis also found that storylines featuring male patients were also significantly more likely to take place in a healthcare setting than those featuring female patients. Taken together, these findings suggest that in popular prime time television, men's health issues are being depicted as more serious than women's. Moreover, viewers may perceive the health information conveyed in storylines revolving around a male character as more credible because they are more often framed within a healthcare setting.

As for the specific health issues portrayed, six of the ten most common health issues were similar for both male and female characters. These included homicide; unusual illnesses; unintentional injuries; motor vehicle related accidents; heart disease; and mental health. In addition, both sexes confronted substance abuse issues, although more males faced illegal substance and prescription medication abuse, while more females confronted alcohol abuse. Female characters also dealt with pregnancy-related issues and sexual assault, while males disproportionately dealt with falls and toxic substance exposure. Interestingly, cancer was more commonly featured as a health concern among female as opposed to male characters. This was due to the heavy focus on breast cancer, a disease seen predominantly in women. Consequently, three out of the ten most frequent health issues confronting women were related to their sexuality, whereas all of the issues confronting male characters appeared to be issues that could have been depicted just as easily using female actors. Ironically, if not for the fact that sexual assault, pregnancy and breast cancer are almost exclusively the domain of females—and therefore require a female character—the relative sex ratio of health storylines in prime time television might be even more lopsided.

As for the health outcomes of these ill or injured characters, there were significantly more males both dying and improving in their health status by the episode's end. The trend of health storylines appearing biased towards male characters is further illustrated in the amount of health information conveyed. In each of the seven categories of health information assessed, storylines that had a male ill or injured character contained more health-related information than those with a female character—differences that were statistically significant in five of these seven categories. These findings unequivocally demonstrate that viewers are exposed to more health information when the drama centers on a male's health problems. Finally, our content analysis confirmed that the educational value of the storyline was significantly stronger when the ill or injured character was a male.

It is important to note that many of the significant differences in the depictions between male and female storylines disappear when comparing proportional differences. In other words, while female characters are featured in far fewer health storylines, when they are featured *how* they are portrayed often mirrors that of male characters. There were, however, some instances where both the raw frequencies and relative proportions of various storyline attributes differed as a function of gender. For example, proportionally, more caregivers, bystanders, and persons who caused the injury were male. In addition, more minor storylines featured males as their protagonists and more prevention information was depicted when the storyline featured a male ill or injured character. In sum, while there appears to be similarities in the content of all health

narratives, the absolute differences in the frequency of male, as opposed to female, characters in popular prime time television is striking, and may have unanticipated and unfortunate effects on viewers.

Potential Limitations

The sample for this study consisted of the most popular scripted shows for three spring television seasons—2004, 2005 and 2006—as ranked by Nielsen Media Research. Our results may not generalize to other years. Moreover, some may argue that the sample should have included nonscripted programs such as reality shows like *American Idol* or *Survivor*. In our defense, we felt that the storylines on nonscripted shows were not comparable to scripted shows because presumably the health content is not pre-planned. With scripted shows there are conscious decisions made by the creative team as to what health content to include and in what way. Therefore, scripted shows present a better opportunity for health interventions. Public health agencies and advocates can—and do—provide health information to creative teams that facilitates both storyline development and public health goals. In fact, this project was conducted in collaboration with Hollywood, Health & Society, a program that acts as a health information resource for Hollywood writers and producers, and has received funding from several public health agencies, such as the Centers for Disease Control and Prevention, and the National Institutes of Health.

Perhaps a more serious limitation of the present research is that, while it demonstrates relative differences in the roles and ratios of males and females in prime time programming, we do not directly test the impact of these portrayals on the knowledge, attitudes and behavior of viewers. This is an obvious next step.

Conclusion

For many years, medical researchers used the male body as the norm and differences in female bodies were primarily ignored (Lawrence and Bendixen 1992; Ratcliff 2002). While there has certainly been progress in the scientific community, our findings suggest that this is not necessarily reflected in popular culture. In many ways, this study suggests television programs are more comfortable dealing with the male body and its ailments rather than the female body. Unfortunately, prior research shows that this gender disparity may have a very real and significant impact on female viewers' knowledge and ultimately their health.

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