

Television Viewing and Risk of Sexual Initiation by Young Adolescents

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Objective: To determine if television viewing is associated with the risk of initiating sexual intercourse in young adolescents.

Design: Secondary analysis of data obtained from 1994 through 1996.

Setting: The National Longitudinal Study of Adolescent Health.

Participants: The 4808 students younger than 16 years who had not initiated intercourse before baseline interview.

Exposures: Primary exposure was self-reported daily television watching, categorized as low (<2 hours) or high (≥ 2 hours) use. Secondary exposure was parental regulation of television programming watched.

Main Outcome Measure: Odds ratio for initiating intercourse by 1-year follow-up, adjusted for potential confounders.

Results: At baseline, 2414 (48.8%) subjects watched television 2 or more hours per day. By 1-year follow-up, 791

(15.6%) subjects had initiated intercourse. Sexual initiation was associated with high television use (adjusted odds ratio, 1.35; 95% confidence interval, 1.01-1.79) and lack of parental regulation of television programming (adjusted odds ratio, 1.35; 95% confidence interval, 1.01-1.80). Most subjects (73.8%) reported strong parental disapproval of sex; their overall rate of initiation was 12.5%, and their risk was independently associated with high television use (adjusted odds ratio, 1.72; 95% confidence interval, 1.24-2.40) and lack of parental regulation of television programming (adjusted odds ratio, 1.35; 95% confidence interval, 1.01-1.81). Among adolescents who did not report strong parental disapproval, the rate of sexual initiation was higher (24.1%) but unrelated to television use.

Conclusion: Among young adolescents who reported strong parental disapproval of sex, watching television 2 or more hours per day and lack of parental regulation of television programming were each associated with increased risk of initiating sexual intercourse within a year.

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INITIATION OF SEXUAL INTERCOURSE by younger adolescents is associated with risky sexual behaviors and increases the risk of multiple partners, unwanted pregnancy, sexually transmitted infections, and pelvic inflammatory disease.¹⁻⁵ Several predictors of sexual intercourse during early adolescent years have been identified. These predictors include early puberty, poor self-esteem, depression, poor academic performance, being less religious, low parental education, lack of attentive and nurturing parents, and cultural and family patterns of early sexual experience.⁶⁻¹² Exposure to television is another proposed factor.^{13,14} Although television watching appears to be useful in predicting certain behaviors, most notably violent behavior,¹⁵ it is less clear whether television watching is linked to sexual behavior.

Survey research results demonstrate that television programming watched by

adolescents contains high levels of sexual content, includes little information about sexual risks, and is an important source of information about sex for adolescents.¹⁶⁻¹⁸ Results of a 2005 Kaiser Family Foundation survey showed that the mean amount of television watched per day was more than 3 hours for teens aged 11 to 14 years and about 2.5 hours for those aged 15 to 18 years.¹⁹ Content analysis demonstrates that 70% of the programs favored by teenagers include sexual content.¹⁸ Moreover, adolescents aged 13 to 15 years rank entertainment media as their leading source of information about sexuality and sexual health.¹⁶ Almost 75% of 15- to 17-year-olds believe that sexual content on television influences the behavior of their peers "somewhat" or "a lot."¹⁷

As recently reviewed by Escobar-Chaves et al,¹⁴ few studies have directly addressed the question of whether adolescent exposure to television affects sexual

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behavior, and only 2 have been based on longitudinal data.^{20,21} Peterson et al²¹ found some evidence for a relationship between amount of television viewed and sexual experience in certain subgroups of adolescents. In the other study, Collins et al²⁰ found that viewing more sexual content on television was associated with an increased 1-year risk of sexual initiation.

We performed a secondary analysis of longitudinal data from a large nationally representative sample of adolescents to determine whether self-reported hours of television viewed was associated with initiation of sexual intercourse in young adolescents (aged <16 years) during the subsequent year. We also studied whether parental regulation of television programming was associated with risk of initiation. We hypothesized that adolescents would be more likely to initiate intercourse within 1 year if they (1) watched more television or (2) lacked a parental rule about television programming.

METHODS

SAMPLE

We used data from waves 1 and 2 of the National Longitudinal Study of Adolescent Health (Add Health).²² The sampling frame was all high schools in the United States that had an 11th grade and at least 30 students. A systematic, random sample of 80 high schools and 52 associated feeder schools from across the United States was then selected, stratified according to region, urbanicity, school type, ethnic composition, and school size. Subjects were weighted on the basis of the complex sampling design to establish a representative cohort of all 7th through 12th grade students in the United States.²³ In Add Health, 20 745 of the original in-school sample were randomly selected for in-home interviews, conducted in 1995, which included questions about more sensitive health behaviors. Of these, 16 706 were selected for a second interview approximately 1 year later, and 13 568 completed the interview and received a weight. Median interval between baseline and follow-up interviews was 11 months (interquartile range, 10-12 months). Adolescents who were younger than 16 years at baseline interview and completed 2 interviews (n=7063) were included in our study if they reported at baseline interview that they had never had sexual intercourse (n=5518), if they provided information about the primary exposure of interest (hours of television per week, n=5497), and if covariate data were complete (n=5178). Because of small sample sizes of other races/ethnicities, we further restricted our analysis to subjects who reported their race/ethnicity as non-Hispanic white, non-Hispanic black, or Hispanic (n=4808).

MEASURES

Exposure Variables

Hours of television watched per day at baseline interview was the primary exposure of interest and was calculated from self-reported hours (0-99) of television watched per week. We chose to categorize television use as low (<2 h/d) or high (\geq 2 h/d). A cutoff of 2 h/d was selected to correspond to the American Academy of Pediatrics²⁴ recommended limit for children's television exposure. Two hours per day was also the median daily television exposure for subjects in our sample. In our final models, we explored television hours parameterized as a continuous variable and used an alternate categorization scheme to look

for a dose-response effect by using the following categories of hours of television watched: 0 to less than the 25th percentile, 25th to less than the 50th percentile, 50th to less than the 75th percentile, 75th to less than the 90th percentile, and 90th percentile or greater.

Parental monitoring was a secondary exposure of interest. At baseline interview, subjects were asked if their parents allow them to make their own decisions about which television programs they watch. We refer to adolescents as having a *content rule* if they answered no to this question. Subjects were also asked if they made their own decisions about how much television they watch, but we excluded this *amount rule* variable from our final models because of the concern that it may be highly correlated with hours of television viewed.

Outcome Variable

Initiation of sexual intercourse (defined as penile-vaginal intercourse) was the primary outcome of interest and was reported (yes/no) at follow-up interview. Answers to this and other sensitive questions were obtained by using a confidential computer-assisted self-interviewing system and were entered into a laptop computer.

Covariates

Sociodemographic variables included in this analysis were age (years/months) at baseline interview, sex, race/ethnicity, and maternal education. Race/ethnicity was self-reported and categorized as non-Hispanic white, non-Hispanic black, or Hispanic. Maternal education was reported by the resident mother or mother figure for most subjects or, otherwise, by the subject; responses were classified as less than high school, high school graduate, more than high school, or college or more. Parental presence was assessed by asking each respondent how frequently his/her mother or father was present before school, after school, and at bedtime. We created a dichotomous variable that defined *decreased parental presence at home* as occurring when a parent was *sometimes*, *almost never*, or *never* present at any of these times. Perceived parental tolerance of intercourse was measured by asking subjects at baseline interview if mother and/or father would approve of them having sex at this time of life. If subjects reported anything other than *strong disapproval* they were placed in the category of *does not perceive strong parental disapproval of sex*. Depression was assessed using the sum of responses to 19 items selected from the Center for Epidemiologic Studies Depression Scale, which measures depressive symptoms in the community and has been validated in junior and senior high school students.^{25,26} Higher scores indicated more depressive symptoms. For the purposes of our study, we defined depression as scoring in the top quartile on this scale. Self-esteem was assessed by summing 6 of 10 items modified from the Rosenberg Self-Esteem Inventory, which has good reliability (Cronbach $\alpha = .86$).⁷ We defined low self-esteem as a score below the median. Subjects were asked to assess the importance of religion by using a 5-point scale. We recoded these answers and created a dichotomous variable that classified as *less religious* all who did not respond that religion was *very important*. Educational aspirations were measured with a question asking subjects to rank on a scale of 1 to 5 how likely it is that they will go to college. We recoded answers dichotomously and placed subjects who did not answer *highly likely* in the category of *less likely to attend college*. Other potential covariates that were explored in the univariate analyses but excluded from multivariate models were taking a virginity pledge (yes/no), intelligence as measured by means of the Add Health Picture Vocabulary Test, and pubertal status.

DATA ANALYSIS

Data were weighted by using commercially available software (Stata version 9.0; Stata Corp, College Station, Tex) according to Add Health recommendations to account for complex sampling design.²⁷ We performed univariate and multivariate logistic regression analyses to examine the relationship between baseline television viewing and 1-year initiation of sexual intercourse. Preliminary analysis demonstrated that this relationship varied according to parental attitude toward adolescent engagement in sexual intercourse; therefore, we stratified subsequent analyses according to this variable. We chose to include only covariates that appeared to be related to primary exposure and outcome in univariate analysis or that had been included in previous literature on this subject. We tested for 2-way multiplicative interactions between amount of television watched and all other covariates at the $P < .01$ level.

RESULTS

Our final study sample ($n=4808$) included approximately equal numbers of male and female subjects and had significantly more whites than blacks or Hispanics. Subjects in the final sample watched television a mean of 2.5 h/d and a median of 2.0 h/d. **Table 1** shows selected characteristics of subjects. We stratified analyses according to parental attitude toward sex (strong disapproval vs all others) on the basis of differences between the 2 groups in the relationship between television watching and sexual initiation (**Table 2**).

HOURS OF TELEVISION WATCHED

Overall, subjects who watched television 2 or more hours per day were more likely to initiate sex within 1 year (adjusted odds ratio [aOR], 1.35; 95% confidence interval [CI], 1.01-1.79). **Table 3** shows that this relationship was even stronger (aOR, 1.72; 95% CI, 1.24-2.40) for subjects who reported strong parental disapproval of sex. We failed to find a statistically significant relationship between watching television 2 or more hours per day and 1-year sexual initiation for subjects who did not report strong parental disapproval (Table 3).

We looked for evidence of a stepwise relationship between television hours and risk of sexual initiation among subjects who reported strong parental disapproval of sex. Compared with adolescents in the first quartile of television watching (<0.9 h/d), those in the second quartile (0.9-1.9 h/d) were not more likely to initiate intercourse (aOR, 1.05; 95% CI, 0.70-1.57). For adolescents in the third quartile of television watching (2.0-2.9 h/d), the risk was higher (aOR, 2.14; 95% CI, 1.40-3.26). For adolescents in the 75th to 90th percentile (3.0-4.9 h/d), the aOR was 2.24 (95% CI, 1.46-3.42). For subjects in the top decile of television viewing (≥ 5 h/d), however, the risk of sexual initiation (aOR, 1.02; 95% CI, 0.62-1.66) was not increased compared with those in the lowest quartile of television watching.

PARENTAL REGULATION OF TELEVISION PROGRAMMING (CONTENT RULE)

Lack of parental regulation of television programming was significantly associated with 1-year sexual initia-

Table 1. Characteristics of 4808 Study Subjects at Baseline Interview

Subject Characteristics*	Unweighted No. of Subjects (Weighted %)
Sex	
Female	2682 (53.5)
Male	2126 (46.5)
Race/ethnicity	
Non-Hispanic white	3178 (77.1)
Non-Hispanic black	912 (11.2)
Hispanic	718 (11.7)
Maternal education	
College or more	1266 (23.3)
More than high school	1410 (29.7)
High school	1400 (31.2)
Less than high school	732 (15.8)
Does not perceive strong parental disapproval of sex	1292 (26.2)
Decreased parental presence at home	2159 (44.1)
Depressed	1097 (22.4)
Less religious	2510 (54.1)
Low self-esteem	2211 (45.9)
Less likely to attend college	1982 (42.6)
Watches television ≥ 2 h/d	2414 (48.8)
Makes own decisions about television programming watched (no content rule)	3234 (67.2)
Makes own decision about amount of television watched (no amount rule)	3667 (75.2)

*See Methods section for variable description and categorization.

tion in subjects who reported strong parental disapproval of sex, and the relationship persisted after controlling for multiple possible confounders (Table 3).

INTERACTION BETWEEN HOURS OF TELEVISION WATCHED AND PARENTAL REGULATION

We failed to find evidence of statistically significant multiplicative or additive interaction between television viewing and a content rule on the risk of sexual initiation. However, despite a lower overall rate of intercourse among subjects who reported strong parental disapproval of sex, adolescents who watched television 2 or more hours per day and reported no content rule had the highest rate of sexual initiation (17.1%; 95% CI, 14.5%-20.1%), approximately twice the risk (aOR, 2.48; 95% CI, 1.66-3.70) observed in subjects who watched fewer than 2 h/d and reported a content rule (initiation rate, 6.9%; 95% CI, 5.0%-9.5%).

OTHER COVARIATES

For subjects who reported strong parental disapproval of sex, 1-year initiation of sexual intercourse was independently associated ($P < .05$) with increased age at baseline interview, being black, maternal education of high school or less, being less religious, and being more depressed. For subjects who reported anything other than strong parental disapproval of sex, 1-year initiation of sexual intercourse was independently associated ($P < .05$) with increased age at baseline interview and being black.

Table 2. Risk of Initiating Sexual Intercourse Within 1 Year According to Amount of Television Watched and Perceived Parental Attitude Toward Sexual Initiation

Perceives Strong Disapproval of Sex	Amount of Television Watched						P Value
	<2 h/d			≥2 h/d			
	No. of Subjects	No. Who Initiated Sex	Initiation Rate (%)*	No. of Subjects	No. Who Initiated Sex	Initiation Rate (%)*	
Yes (n = 3516)	1768	203	9.5	1748	276	15.8	<.001
No (n = 1292)	626	162	25.0	666	150	23.2	.61
All (N = 4808)	2394	365	13.5	2414	426	17.8	.02

*Weighted to account for sample design.

Table 3. Odds Ratios for 1-Year Initiation of Sexual Intercourse Stratified According to Adolescent Perception of Parental Attitude Toward Sexual Initiation

Subject Characteristics	Perceives Strong Disapproval of Sex (n = 3516)		Does Not Perceive Strong Disapproval of Sex (n = 1292)	
	OR (95% CI)	aOR* (95% CI)	OR (95% CI)	aOR* (95% CI)
Watches television ≥2 h/d	1.78 (1.29-2.47)	1.72 (1.24-2.40)	0.91 (0.62-1.32)	0.89 (0.60-1.33)
Makes own decisions about television programming watched	1.51 (1.15-1.99)	1.35 (1.01-1.81)	1.45 (0.85-2.47)	1.38 (0.76-2.49)
Age (in years) at baseline interview	1.53 (1.32-1.77)	1.53 (1.32-1.77)	1.35 (1.11-1.64)	1.31 (1.08-1.59)
Sex				
Female	1.22 (0.91-1.63)	1.20 (0.88-1.64)	1.37 (1.00-1.88)	1.18 (0.85-1.62)
Male	1.00			
Maternal education				
College or more	1.00			
More than high school	1.42 (0.94-2.15)	1.23 (0.79-1.91)	1.16 (0.74-1.81)	1.19 (0.74-1.92)
High school	1.95 (1.35-2.83)	1.61 (1.08-2.40)	1.34 (0.85-2.12)	1.30 (0.81-2.09)
Less than high school	2.53 (1.62-3.93)	1.85 (1.08-3.17)	1.39 (0.84-2.30)	1.39 (0.80-2.41)
Race				
Non-Hispanic white	1.00			
Non-Hispanic black	1.89 (1.31-2.73)	1.77 (1.26-2.47)	1.56 (1.10-2.21)	1.65 (1.09-2.50)
Hispanic	1.39 (0.93-2.08)	1.01 (0.63-1.62)	1.12 (0.57-2.20)	1.01 (0.51-1.97)
Decreased parental presence at home	1.15 (0.91-1.47)	1.08 (0.83-1.40)	1.28 (0.92-1.78)	1.31 (0.94-1.84)
Depressed	2.21 (1.69-2.90)	1.72 (1.27-2.33)	1.06 (0.78-1.45)	0.88 (0.63-1.23)
Less religious	1.59 (1.20-2.11)	1.63 (1.25-2.12)	0.99 (0.70-1.45)	0.99 (0.68-1.45)
Low self-esteem	1.48 (1.15-1.91)	1.11 (0.83-1.48)	1.64 (1.07-2.50)	1.51 (0.98-2.32)
Less likely to attend college	1.61 (1.23-2.10)	1.29 (0.96-1.73)	1.28 (0.88-1.89)	1.27 (0.84-1.91)

Abbreviations: aOR, adjusted odds ratio; CI, confidence interval; OR, odds ratio.

*Adjusted for all variables listed.

COMMENT

We used longitudinal data to examine the relationships between amount (hours per day) of television viewing and parental regulation of content on sexual initiation. Studying data in a large, nationally representative sample of young adolescents, we found a positive association between viewing television 2 or more hours per day and the subsequent 1-year risk of initiation of sexual intercourse in adolescents who report strong parental disapproval of sex. We also found that lack of parental regulation of television programming was associated with increased 1-year risk of sexual initiation in these adolescents. The magnitude of these associations remained constant after controlling for multiple potential confounders. Although we failed to find any statistically significant

interaction between the amount of television watched and parental regulation of content, we found that among subjects who reported strong parental disapproval of sex, the rate of initiation was highest among those who watched television 2 or more hours per day and had no content rule and that the risk of sexual initiation was approximately twice that observed in subjects who watched less television and reported a content rule.

Our finding that hours of television viewed is associated with 1-year sexual initiation differs somewhat from results of the 2 other longitudinal studies available on this subject.^{20,21} Peterson et al²¹ found a positive, but inconsistent, relationship between hours of television watched and sexual initiation for boys; however, this study was based on television viewing data from the 1970s, which may not reflect more recent programming. Col-

lins et al²⁰ reported that the amount of sexual content viewed, but not hours of television watched, was a significant risk factor for sexual initiation. This finding was based on a multivariate model that, by design, retained separate variables for amount of television watched and amount of sexual content watched.²⁰ Because we did not have any data available on the sexual content of programs watched by the subjects in our study, it is difficult to compare our results directly with those of Collins et al.²⁰

Previous research results showed that adolescent perception of parental attitude toward sex is related to sexual initiation.^{28,29} On the basis of our results, we hypothesize that for adolescents who do not perceive strong parental disapproval of sex and are already at higher risk for sexual initiation, television may not have affected their behavior. However, for adolescents who perceive strong parental disapproval of sex and are at lower risk for sexual initiation, contradictory messages, such as those seen on television, may be more influential.

Although results of our study and those of Collins et al²⁰ provide evidence that television watching increases the risk of sexual initiation by adolescents, neither study's results resolve the question of whether attempting to control content or limit amount of television watched would be most likely to reduce this risk. Limiting amount of television may be easier and more effective than limiting content, given the pervasiveness of sexual content in television programming.¹⁸ In addition, unlike limiting content, limiting the amount of television children watch may have collateral benefits such as prevention of obesity³⁰ and reduction in aggressive behavior.³¹

We found that adolescents in the top 10th percentile of television viewing (≥ 5 h/d) were not at increased risk of sexual initiation. This result provides support for a theoretical *babysitter effect*²⁰ or *displacement effect* in which certain adolescents may spend extraordinary amounts of time viewing television and are therefore less likely to participate in other activities or to initiate sexual activity. Failure to account for such an effect may distort attempts to understand the true effect of increased television watching, especially if amount of television is modeled as a continuous variable.

We found that lack of a content rule was associated with 1-year sexual initiation only among adolescents who reported strong parental disapproval of sex, a result related to that of Peterson et al,²¹ who found that covieing television and discussing television with parents were related to decreased sexual initiation in certain adolescents. These results support the hypothesis that parental regulation of television viewing may affect television-related outcomes in some adolescents.

Effects of parental regulation have been studied previously. Although results of some studies showed that certain types of regulation are associated with differences in television-related behavior,³²⁻³⁴ additional research is needed to understand whether mediation of television use by parents might influence television-related sexual behavior.

Strengths of this study include use of a data set that is longitudinal, provides a nationally representative sample, and has good measures of individual and family characteristics that are important control variables. Using lon-

gitudinal data eliminates the potential for reverse causality, a possible problem in cross-sectional studies.^{35,36} The generalizability of our study results is strengthened by the comparability of mean hours of television watched in our sample to that in other large nationally representative samples.¹⁹

Our study has several limitations. First, the available measure of television exposure, a self-reported global estimate, was crude and may be less accurate than a viewing diary or other format that includes more than 1 measure across time. We recommend that future surveys designed to explore determinants of adolescent health include more extensive questions to establish the quantity and quality of adolescent exposure to multiple types of media. Second, although we adjusted for many potential confounders, our results still may be subject to residual confounding due to unmeasured social or environmental factors. In particular, rules about television content may be a proxy measure for parental willingness to monitor other behaviors that may be associated with the risk of sexual initiation. Third, available data provided no direct measure of the content of television programming watched. Although this is an important limitation given the diversity of programming that different adolescents are likely to select, it is still reasonable to assume that those who watch more television will see more sexual content given the high level of sexual content in shows that adolescents watch. Fourth, our outcome measure was limited to sexual intercourse defined as vaginal/penile intercourse, and we had no information on oral sex or other types of sexual behavior that are increasingly prevalent among teens. Future surveys should include questions about other types of sexual behavior. Fifth, because we excluded those who had already initiated intercourse, we necessarily selected for subjects who were slightly younger, included somewhat more female and white subjects, included fewer black subjects, and had a higher maternal educational status (data not shown). Finally, the data used for the study were almost 10 years old, and the sexual content of television programming has changed over that time.¹⁸ In addition, as adolescents have increasing sources of media available to them, such as the Internet, the amount of television they watch and its role in their lives may be changing.¹⁹

The American Academy of Pediatrics recommends that children and adolescents view television no more than 2 hours each day and that parents take an active role in guiding television use.^{24,37} Although there is limited evidence about the effectiveness of these recommendations, our results suggest that successful implementation of these guidelines may diminish the risk of early sexual initiation by young adolescents. Further research is needed to understand how families might effectively minimize the potential harms to children and adolescents associated with television exposure, whether by limiting total amount of television watched or by limiting access to specific types of programming. Interventions, including clinic-based interventions, designed to alter television use and improve parental mediation of television use should continue to be developed and tested to determine if they are feasible and effective in changing television use and its behavioral effects.

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