ORIGINAL INVESTIGATION

Association Between Work–Family Conflict and Smoking Quantity Among Daily Smokers

Jonathan T. Macy PhD¹, Laurie Chassin PhD², Clark C. Presson PhD²¹Department of Applied Health Science, Indiana University School of Public Health, Bloomington, IN; ²Department of Psychology, Arizona State University, Tempe, AZCorresponding Author: Jonathan T. Macy, PhD, Department of Applied Health Science, Indiana University School of Public Health, 1025 E. Seventh Street, Bloomington, IN 47405, USA. Telephone: 812-856-0704; Fax: 812-855-3936; E-mail: jtmacy@indiana.edu

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ABSTRACT

Introduction: Recent work demonstrated a direct relation between work–family conflict and likelihood of smoking. This study furthered this area of research by (a) testing the association between work–family conflict and smoking quantity and (b) testing demographic, workplace, and home factors as moderators of this relation.

Methods: Participants ($N = 423$) were daily smokers from a Midwestern community-based sample. Ordinal regression analysis tested work-to-home and home-to-work conflict as predictors (after controlling for demographic characteristics, home factors, and workplace factors) of smoking quantity. Additionally, we tested whether the demographic, home, and workplace factors moderated the effects of work-to-home conflict and home-to-work conflict on smoking quantity.

Results: Males ($OR = 8.81, p = .005$), older participants ($OR = 1.09, p = .012$), those with less educational attainment ($OR = 1.87, p = .001$), those who reported lower levels of workplace smoking restrictions ($OR = 0.87, p = .019$), and those who reported higher levels of work-to-home conflict ($OR = 1.39, p = .026$) smoked more cigarettes per day. There was no significant main effect of home-to-work conflict on smoking quantity ($OR = 1.46, p = .099$). A significant interaction ($OR = 0.55, p = .043$) revealed that home-to-work conflict was associated with smoking quantity for females but not for males.

Conclusions: After controlling for demographic characteristics and potential confounders, work-to-home conflict had a negative impact on smoking quantity for all participants, and home-to-work conflict was associated with smoking quantity for women. Workplace wellness programs to reduce smoking among employees should take into account the direction of conflict and how the effect of the conflict on smoking behavior may vary based on other factors.

INTRODUCTION

Prior research has demonstrated the negative effect of work–family conflict on health outcomes such as hypertension (Frone, Russell, & Cooper, 1997) and mental disorders (Frone, 2000; Wang, Afifi, Cox, & Sareen, 2007), and health behaviors such as alcohol use (Frone, Russell, & Barnes, 1996; Frone et al., 1997; Grzywacz & Marks, 2000; Wang, Liu, Zhan, & Shi, 2010) and physical activity (Allen & Armstrong, 2006). There are several possible mediating mechanisms to explain the effect of such conflict on health, including stress and interference with one's ability to maintain healthy behaviors and seek routine medical care. In addition, individuals may engage in unhealthy behaviors as a way to cope with stress (Ng & Jeffrey, 2003). Recent work has demonstrated an association between work–family conflict and cigarette smoking (Nelson, Li, Sorensen, & Berkman, 2012). Among a sample of mostly female long-term care workers, those who reported conflict in both directions, that is more work-to-home conflict and

more home-to-work conflict, were significantly more likely to smoke. In an earlier study, Frone, Barnes, and Farrell (1994) found an indirect relationship between both work-to-home and home-to-work conflict and smoking among employed women who had adolescent children. This study tests the effects of work-to-home conflict and home-to-work conflict among a sample of daily smokers from a large community sample. We extend prior research by considering the effects of home and workplace factors, including workplace smoking restrictions, as potential confounders and moderators of the effects of work–family conflict.

Following the strategy used by Nelson et al. (2012), we controlled for several potential confounders of the relation between work–family conflict and cigarette smoking. These included demographic characteristics such as gender, age, and educational attainment. National epidemiologic data demonstrate that females, those who are older, and those with higher educational attainment are less likely to smoke (Centers for Disease Control and Prevention, 2011). We also controlled

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for home and workplace factors that may independently predict smoking behavior. The home factors were family stress, marital status, and number of children living at home. The workplace factors were job demands, job latitude, number of hours worked per week, full-time versus part-time employment status, and extent of workplace smoking restrictions.

Also consistent with Nelson et al.'s (2012) approach, we tested the effects of both work-to-home conflict and home-to-work conflict. Previous research has shown that the direction of the conflict can be an important distinction (Frone et al., 1996; Greenhaus & Beutell, 1985). In the study of Nelson et al. (2012), home-to-work conflict, but not work-to-home conflict, was significantly associated with likelihood of smoking. Moreover, those who reported conflict in both directions were more likely to smoke than those who reported one type of conflict. Importantly, these were dichotomous measures based on responses to one item for each type of conflict. For this study, participants responded to multiple items about the two directions of conflict, which enabled us to compute continuous measures that reflected a range of both types of conflict rather than only whether the conflict existed. To examine the effect of high levels of conflict in both directions, we tested the interaction between work-to-home conflict and home-to-work conflict as a predictor of smoking quantity.

We also examined whether the effects of work-to-home conflict and home-to-work conflict on smoking quantity varied as a function of demographic characteristics, home factors, and workplace factors. In terms of demographic factors, gender represents a likely moderator. It has been suggested that work–family conflict may be more detrimental for working women in influencing health behaviors because they are more likely to have primary responsibility for family roles (Frone, 2000). We, therefore, expected that the relation between both work-to-home conflict and smoking quantity and home-to-work conflict and smoking quantity would be stronger for women than for men. The evidence in the current literature regarding moderators of the relation between work–family conflict and health is limited and inconclusive. Findings of one prior study suggested that work-to-home conflict was more strongly related to depression and anxiety among women than men, but home-to-work conflict was more strongly related to depression and anxiety among men than among women (MacEwen & Barling, 1994). However, multiple studies have found no evidence of moderation of the relations between conflict and negative health behaviors, including smoking, by demographic factors (Frone et al., 1994, 1996, 1997, 2000; Grzywacz & Marks, 2000). In addition to gender, we tested educational attainment and age as potential demographic moderators.

Moreover, it is possible that the effect of work–family conflict on smoking may vary as a function of home and workplace factors. That is, factors at home or in the workplace may either exacerbate or buffer the relation between work–family conflict and a negative health behavior such as smoking. For example, a study of work–family conflict and alcohol use found that family and coworker support buffered the negative effect of conflict on drinking (Wang et al., 2010). Thus, we tested interactions between home and workplace factors and the two types of conflict as predictors of smoking quantity. We predicted that high levels of family stress, high levels of job demands, low levels of job latitude, and working more than 40 hr per week would exacerbate the relation between work–family conflict and smoking.

In sum, this study utilized a community sample to test the effects of work-to-home conflict and home-to-work conflict on smoking quantity among daily smokers. We controlled for known demographic predictors of smoking and for home and workplace factors that may independently predict smoking behavior. Finally, this study is the first to examine whether multiple demographic characteristics moderate the relations between the two types of conflict and smoking quantity, and whether home and workplace factors exacerbate or buffer the effects of the two types of conflict on smoking quantity.

METHODS

Participants

Participants were from the Indiana University Smoking Survey, an ongoing cohort-sequential study of the natural history of cigarette smoking (Chassin, Presson, Sherman, & Pitts, 2000). Between 1980 and 1983, all consenting 6th to 12th graders in a Midwestern county school system completed annual surveys. The total sample size of those who were assessed at least once was 8,487. Follow-up surveys were conducted in 1987, 1993, 1999, and 2005. An additional wave of follow-up started in late 2009 and is nearing completion (this wave is referred to as the 2011 wave). At each completed wave, 70% or more of the original sample has been retained. The original 1980–1983 survey data were collected with group-administered questionnaires in school. In 1987, these procedures were followed for cohorts who were still in high school. For older cohorts and for all participants in 1993, 1999, 2005, and 2011, a survey was sent by mail followed by telephone interviews, and an online survey in 2011, if surveys were not returned. Participants were paid \$15–\$35 over the waves, and in 1999, 2005, and 2011 they were also entered into lottery drawings for cash prizes up to \$500. The research protocol was approved by the Institutional Review Board at Indiana University, and informed consent was obtained for participation in the research.

Demographically, the sample is similar to the community from which it was drawn. For example, the marriage rate is 64% in this sample compared with 66% among similarly aged adults in the Midwest (Lugaila, 1998), and the high school graduation rate is 97% in this sample compared with 92% among similarly aged adults in the Midwest (Day & Curry, 1998). Thus, the sample is representative of its community, one that is well educated and predominantly White. At the current follow-up, 48.5% reported educational attainment of at least a bachelor's degree. Because the sample is 96% non-Hispanic Caucasian, ethnic differences are not considered. Attrition biases have been discussed in detail elsewhere (Rose, Chassin, Presson, & Sherman, 1996). For each follow-up, those who were lost were compared with those who were retained in terms of their earlier data. Those lost to follow-up were more likely to be smokers, have more positive attitudes and beliefs about smoking, and have parents and friends who smoked.

For this study, we selected participants who completed the mailed survey in 2011 and reported daily cigarette smoking and at least part-time employment. We excluded 43 participants who lived alone, were unmarried, and had no children. After eliminating 44 individuals due to missing data on covariates or the predictor variables of interest, the final sample eligible for analyses was 423.

Measures

Demographics

Participants reported their gender, age, and highest level of education completed. For analyses, educational attainment was dichotomized into no post-high school education versus some post-high school education.

Home Factors

Participants reported their marital status and the number of children living at home. For analyses, marital status was dichotomized into married versus unmarried, and number of children at home was dichotomized into one or more versus none. In addition, we created a family stress variable by averaging participant responses to one item about marital or relationship stress (“How stressful is your marriage [or serious relationship]?”; Caplan, Price, & Vinokur, 1982) and one item about parenting stress (“How stressful is your role as a parent?”), each measured on a 5-point scale from not at all stressful to extremely stressful. For participants who were not married or in a serious relationship or had no children, we used the score for the one available item. A higher score indicated more family stress (mean score = 2.24, $SD = 0.88$, range 1–5).

Workplace Factors

Workplace-related variables included in this study were based on previous studies showing them to relate to smoking behavior (e.g., Bauer, Hyland, Li, Steger, & Cummings, 2005; Eriksen, 2005; Fichtenberg & Glantz, 2002). To assess job demands, participants responded to four items about psychological job demands (e.g., “My job requires me to work hard”) measured on a 5-point scale from not at all to a great deal (Schwartz, Pieper, & Karasek, 1998). Responses to the four items were averaged, and a higher score reflected more job demands (mean score = 3.58, $SD = 0.94$, range 1–5, Cronbach’s $\alpha = 0.821$). To assess job latitude, participants responded to seven items (e.g., “My job allows me to choose how to perform work”) measured on a 5-point scale from not at all to a great deal (Schwartz et al., 1998). Responses to the seven items were averaged, and a higher score reflected more job latitude (mean score = 3.40, $SD = 1.04$, range 1–5, Cronbach’s $\alpha = 0.925$). Participants were split into those who reported working 40 hr or less versus those who reported working more than 40 hr, and participants were divided into those who worked part-time and those who worked full-time. Finally, the extent of workplace smoking restrictions was assessed with a single item, “How much does your workplace limit cigarette smoking?” measured on a 5-point scale from not at all to a great deal. The mean response was 3.22 ($SD = 1.50$, range 1–5).

Work–Family Conflict

We assessed work–family conflict in two directions, work-to-home conflict and home-to-work conflict, using items from the Midlife in the United States Study (Brim, Ryff, & Kessler, 2004). For work-to-home conflict, participants responded to three items (“How often does stress at work make you irritable at home?”, “How often do job worries or problems distract you when you are at home?”, and “How often does your job make you feel too tired to do the things that need attention at home?”) measured on a 5-point scale from never to all of the time. Responses to the three items were averaged, and a higher score

reflected more work-to-home conflict (mean score = 2.97, $SD = 0.72$, range 1–5, Cronbach’s $\alpha = 0.752$). For home-to-work conflict, participants responded to five items (“How often do personal or family worries and problems distract you when you are at work?”, “How often do responsibilities at home prevent you from getting the amount of sleep you need to do your job well?”, “How often does stress at home make you irritable at work?”, “How often does the love and respect you get at home make you feel confident about yourself at work?”, and “How often does your home life help you relax and feel ready for the next day’s work?”) measured on a 5-point scale from never to all of the time. Responses to the five items were averaged, and a higher score reflected more home-to-work conflict (mean score = 2.56, $SD = 0.60$, range 1–5, Cronbach’s $\alpha = 0.697$).

Smoking Quantity

Participants reported the quantity of cigarettes usually smoked in a day by choosing one of the following response categories: 1–4 (9% of participants), 5–9 (13%), 10–14 (18%), 15–20 (34%), 21–30 (17%), 31–40 (8%), and more than 40 (1%). As reported elsewhere, the validity of the self-reported smoking in this sample has been supported in a substudy using an unannounced bioassay (Chassin, Presson, Sherman, & Edwards, 1990).

Data Analyses

Ordinal regression was used to model smoking quantity using gender, age, educational attainment, family stress, marital status, presence of children at home, job demands, job latitude, number of hours worked per week, employment status, extent of workplace smoking restrictions, work-to-home conflict, and home-to-work conflict as predictors. All predictors were entered simultaneously. Two-way interaction terms were then entered one at a time to the model, and nonsignificant interactions were trimmed from the final model.

We tested the proportional odds assumption (i.e., the test of parallel lines) for the regression model. The test did not reach statistical significance ($p = .230$), providing evidence that the assumption had not been violated. Thus, the odds estimated for each predictor were not significantly different across the seven categories of the dependent variable.

In terms of model statistics, the overall model test showed that the null hypothesis that the model without predictors is as good as the model with predictors should be rejected ($-2 \log$ likelihood chi-square = 56.621, $p < .001$). In addition, the Pearson goodness-of-fit measure indicates that the data fit the model well (chi-square = 2436.334, $p = .876$).

RESULTS

Sample characteristics are shown in Table 1. The sample was evenly split between males and females, the mean age was 43.6, and slightly more than half of participants had some post-high school education. The low level of educational attainment in this sample reflects our selection of daily smokers. In terms of home factors, 59% were married, and 60% had at least one child at home. In terms of employment, 41% reported working more than 40 hr per week, and 89% were employed full-time.

Association between work–family conflict and smoking quantity

Table 1. Sample Characteristics (*N* = 423)

	<i>n</i>	%	Mean	<i>SD</i>	Range
Demographic characteristics					
Gender					
Male	218	51.5	–	–	–
Female	205	48.5	–	–	–
Age, years	–	–	43.6	2.7	38–51
Education					
No post-high school	192	45.4	–	–	–
Some post-high school	231	54.6	–	–	–
Home factors					
Family stress	–	–	2.24	0.88	1–5
Marital status					
Married	250	59.1	–	–	–
Unmarried	173	40.9	–	–	–
Children at home					
None	170	40.2	–	–	–
One or more	253	59.8	–	–	–
Workplace factors					
Job demands	–	–	3.58	0.94	1–5
Job latitude	–	–	3.40	1.04	1–5
Hours worked per week					
40 or less	249	58.9	–	–	–
More than 40	174	41.1	–	–	–
Employment status					
Part-time	45	10.6	–	–	–
Full-time	378	89.4	–	–	–
Workplace smoking restrictions	–	–	3.22	1.50	1–5
Work–family conflict					
Work-to-home conflict	–	–	2.97	0.72	1–5
Home-to-work conflict	–	–	2.56	0.60	1–5
Smoking quantity					
1–4 cigarettes per day	39	9.2	–	–	–
5–9 cigarettes per day	54	12.8	–	–	–
10–14 cigarettes per day	76	18.0	–	–	–
15–20 cigarettes per day	145	34.3	–	–	–
21–30 cigarettes per day	71	16.8	–	–	–
31–40 cigarettes per day	33	7.8	–	–	–
More than 40 cigarettes per day	5	1.2	–	–	–

Note. *SD* = standard deviation.

Finally, for smoking quantity, the largest proportion of participants (34%) reported usually smoking 15–20 cigarettes per day.

Results of the ordinal regression analysis predicting smoking quantity from demographic variables, home factors, workplace factors, work-to-home conflict, and home-to-work conflict are presented in Table 2. The pseudo R^2 for the model was .13. In terms of demographic predictors, males, older participants, and those with no post-high school education smoked more cigarettes per day. None of the home factors tested was significantly related to smoking quantity. Of the workplace factors tested, only extent of workplace smoking restrictions was significantly associated with smoking quantity.

The effects of most interest for this study were those of work-to-home conflict and home-to-work conflict. As shown in Table 2, after adjusting for effects of demographic characteristics, home factors, and workplace factors, work-to-home conflict had a significant unique effect on smoking quantity. Participants who reported higher levels of work-to-home

conflict smoked more cigarettes per day. However, there was no significant main effect of home-to-work conflict on smoking quantity.

We also tested two-way interactions between the covariates and work-to-home conflict, between the covariates and home-to-work conflict, and between work-to-home conflict and home-to-work conflict. Only one interaction, home-to-work conflict by gender, was statistically significant. To probe this interaction, we split the sample by gender and again used ordinal regression to model smoking quantity using age, educational attainment, family stress, marital status, presence of children at home, job demands, job latitude, number of hours worked per week, employment status, extent of workplace smoking restrictions, work-to-home conflict, and home-to-work conflict as predictors. This probing of the home-to-work conflict by gender interaction revealed that home-to-work conflict was associated with smoking quantity for females (estimate = 0.66, SE = 0.27, p = .012, OR = 1.94, 95% CI = 1.15, 3.26) but not for males (estimate = –0.35, SE = 0.26, p = .182, OR = 0.71, 95% CI = 0.43, 1.18).

DISCUSSION

This study adds to the literature on the negative effect of work–family conflict on smoking. Consistent with the two previous studies that examined cigarette smoking as an outcome (Frone et al., 1994; Nelson et al., 2012), the results from our study suggest that individuals who experience more work–family conflict are more likely to engage in smoking behavior with a higher level of health risk. For example, Nelson et al. (2012) found a positive relation between work–family conflict and likelihood of any smoking, and our data demonstrate a positive relation between work–family conflict and smoking quantity among daily smokers. Moreover, our study extends this area of research in important ways. First, our sample included an equal proportion of males and females, whereas prior studies focused primarily on women. Second, our study is the first to systematically test for moderation of the relation between work–family conflict and smoking behavior by demographic, home, and workplace factors.

The first finding of note was that work-to-home conflict was associated with smoking quantity, whereas home-to-work conflict was not. That is, the daily smokers in this sample who reported higher levels of work-to-home conflict smoked significantly more cigarettes per day. However, we found no significant main effect of home-to-work conflict on smoking quantity. Interestingly, this is the opposite of what Nelson et al. (2012) found in their study of this issue among nursing home workers. They reported a strong relationship between home-to-work conflict and smoking likelihood, but a weak relationship between work-to-home conflict and smoking likelihood. There are multiple possible reasons for these seemingly contradictory findings. One explanation is the different outcomes that were tested. Nelson et al. (2012) used smoking likelihood as the outcome, whereas we used smoking quantity. Perhaps, home-to-work conflict is more persistent or chronic and therefore more related to inability to quit or stay abstinent. Another reason may be the very different samples studied. This study included a community-based sample of smokers representing a wide range of occupations,

Table 2. Results for Ordinal Regression Model Predicting Smoking Quantity (*N* = 423)

Predictor	Estimate	SE	<i>p</i> value	OR	95% CI
Demographic characteristics					
Male gender (vs. female)	2.18	0.78	.005	8.82	1.91, 40.85
Age	0.08	0.03	.012	1.09	1.02, 1.16
No post-high school education (vs. some post-high school education)	0.63	0.18	.001	1.87	1.31, 2.66
Home factors					
Family stress	−0.03	0.12	.822	0.97	0.77, 1.23
Unmarried (vs. married)	−0.04	0.19	.827	0.96	0.66, 1.39
No children at home (vs. one or more children at home)	0.07	0.19	.720	1.07	0.74, 1.55
Workplace factors					
Job demands	0.10	0.11	.385	1.10	0.89, 1.37
Job latitude	−0.10	0.09	.291	0.91	0.76, 1.08
Worked 40 hr or less per week (vs. worked more than 40 hr per week)	0.11	0.19	.563	1.12	0.77, 1.63
Employed part-time (vs. employed full-time)	−0.23	0.30	.449	0.80	0.44, 1.43
Workplace smoking restrictions	−0.14	0.06	.019	0.87	0.77, 0.98
Work–family conflict					
Work-to-home conflict	0.33	0.15	.026	1.39	1.04, 1.86
Home-to-work conflict	0.38	0.23	.099	1.46	0.93, 2.30
Interactions ^a					
Home-to-work conflict by male gender (vs. female)	−0.60	0.30	.043	0.55	0.31, 0.98

Note. SE = standard error; OR = odds ratio; CI = confidence interval.

^aNonsignificant interactions were trimmed from model.

whereas the Nelson et al. (2012) sample was comprised completely of long-term care workers. Finally, these inconsistent findings may be explained by gender differences. The findings of Nelson et al. (2012) of a stronger association between home-to-work conflict and smoking behavior was among a sample that was 82% female. In our study, although there was no main effect of home-to-work conflict on smoking quantity, we did find a significant interaction between home-to-work conflict and gender in predicting smoking quantity. Probing of this interaction showed that, in fact, home-to-work conflict was positively associated with smoking quantity for females but not for males. Thus, the relation between home-to-work conflict and smoking appears to be stronger for working women than working men.

Therefore, as argued in previous research dealing with work–family conflict (Frone et al., 1996; Greenhaus & Beutell, 1985), the direction of the conflict is an important consideration. Moreover, the direction of the conflict may have different consequences for women than for men. In this study of daily smokers, work-to-home conflict was associated with increased quantity of smoking for both men and women. However, the relation between home-to-work conflict and smoking quantity was observed only for women. These findings have implications for workplace wellness programs designed to reduce smoking among employees by addressing conflict between the home and workplace. Interventions may be more successful by targeting different directions of work–family conflict for men than for women. Another workplace wellness initiative to reduce smoking that is supported by the current findings is restricting smoking at work. There was a significant negative relationship between extent of workplace smoking restrictions and smoking quantity in this sample. This is consistent with substantial evidence demonstrating the effectiveness of workplace smoke-free air policies in reducing smoking (Bauer et al., 2005; Fichtenberg & Glantz, 2002).

An unexpected finding was that, of the home and workplace factors tested, extent of workplace smoking restrictions was the only factor significantly associated with smoking quantity. It is possible that the effects of the other home and workplace factors were moderated by demographic characteristics. However, our relatively small sample size and use of ordinal regression might have limited our statistical power to detect such instances of moderation. In addition, we did not find evidence to suggest that any of the home and workplace factors tested moderated the relations between work-to-home conflict and smoking quantity and between home-to-work conflict and smoking quantity. Although Wang et al. (2010) found a buffering effect of family and coworker support on the relation between work–family conflict and drinking, our results did not provide evidence for such an effect for smoking. Again, this null finding may be attributable to small sample size and our use of ordinal regression. This question is worth exploring in future studies with large samples.

Although this study makes an important contribution to the literature, there are limitations that must be considered. First, the community from which this representative sample was drawn is predominantly White, so some caution is warranted in generalization. In addition, testing for moderating effects of race and ethnicity was not feasible. Second, other characteristics of the sample may limit generalizability. For example, this sample is predominately Midwestern, so findings may not generalize to other geographic regions. In addition, although attrition biases for the longitudinal study that provides the sample for this study are small in magnitude, caution is warranted when making generalizations. Third, as noted above, our relatively small sample size may have hindered our ability to detect additional interaction effects. Finally, this was a cross-sectional study, so conclusions about causal relationships among variables are not possible. Although we have longitudinal data, the long-time interval between waves of data collection limits the ability to

test effects of changes in work–family conflict as prospective predictors of changes in smoking quantity. To do so would require multiple waves of follow-up at relatively short intervals.

Despite these limitations, this study showed that work-to-home conflict had a negative impact on smoking quantity among a sample of daily smokers. Importantly, the association between work-to-home conflict and smoking quantity was present after controlling for demographic characteristics and several potential confounders. In addition, home-to-work conflict was associated with smoking quantity among women. This adds to the growing evidence that conflict between work and family is related to negative health behaviors (Allen & Armstrong, 2006; Frone et al., 1996, 1997; Grzywacz & Marks, 2000; Wang et al., 2010), including smoking (Frone et al., 1994; Nelson et al., 2012). Moreover, the results of this study suggest that this type of conflict influences smoking behavior differently for men and women. Workplace wellness programs that take this into account may find further success in reducing smoking among workers.

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DECLARATION OF INTERESTS

None declared.

REFERENCES

Allen, T. D., & Armstrong, J. (2006). Further examination of the link between work-family conflict and physical health: The role of health-related behaviors. *American Behavioral Scientist*, 49, 1204–1221. doi:10.1177/0002764206286386

Bauer, J. E., Hyland, A., Li, Q., Steger, C., & Cummings, M. K. (2005). A longitudinal assessment of the impact of smoke-free worksite policies on tobacco use. *American Journal of Public Health*, 95, 1024–1029. doi:10.2105/AJPH.2004.048678

Brim, O., Ryff, C., & Kessler, R. (Eds.). (2004). *How healthy are we: A national study of well-being at midlife*. Chicago: University of Chicago Press.

Caplan, R., Price, R. H., & Vinokur, A. (1982). *Questionnaire measures used in the project Prevention Interventions for the Unemployed* (Unpublished manuscript). University of Michigan, Ann Arbor.

Centers for Disease Control and Prevention. (2011). *Behavioral risk factor surveillance system data*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.

Chassin, L., Presson, C. C., Sherman, S. J., & Edwards, D. (1990). The natural history of cigarette smoking: Predicting young-adult smoking outcomes from adolescent smoking patterns. *Health Psychology*, 9, 701–716. doi:10.1037//0278-6133.9.6.701

Chassin, L., Presson, C. C., Sherman, S. J., & Pitts, S. (2000). The natural history of cigarette smoking from adolescence to adulthood in a midwestern community sample: Multiple trajectories and their psychosocial correlates. *Health Psychology*, 19, 223–231. doi:10.1037//0278-6133.19.3.223

Day, J., & Curry, A. (1998). *Educational attainment in the United States: March 1998 (Update)*. U.S. Bureaus of the

Census, Current Population Reports, Series P20-513. Washington, DC: U.S. Government Printing Office.

Eriksen, W. (2005). Work factors and smoking cessation in nurses' aides: A prospective study. *BMC Public Health*, 5, 142. doi:10.1186/1471-2458-5-142

Fichtenberg, C. M., & Glantz, S. A. (2002). Effect of smoke-free workplaces on smoking behaviour: Systematic review. *British Medical Journal*, 325, 188–194. doi:10.1136/bmj.325.7357.188

Frone, M. R. (2000). Work-family conflict and employee psychiatric disorders: The National Comorbidity Survey. *Journal of Applied Psychology*, 85, 888–895. doi:10.1037//0021-9010.85.6.888

Frone, M. R., Barnes, G. M., Farrell, M. P. (1994). Relationship of work-family conflict to substance use among employed mothers: The role of negative affect. *Journal of Marriage and the Family*, 56, 1019–1030. doi:10.2307/353610

Frone, M. R., Russell, M., & Barnes, G. M. (1996). Work-family conflict, gender, and health-related outcomes: A study of employed parents in two community samples. *Journal of Occupational Health Psychology*, 1, 57–69. doi:10.1037//1076-8998.1.1.57

Frone, M. R., Russell, M., & Cooper, M. L. (1997). Relation of work-family conflict to health outcomes: A four-year longitudinal study of employed parents. *Journal of Occupational and Organizational Psychology*, 70, 325–335. doi:10.1111/j.2044-8325.1997.tb00652.x

Greenhaus, J. H., & Beutell, N. J. (1985). Sources of conflict between work and family roles. *Academy of Management Review*, 10, 76–88. doi:10.5465/AMR.1985.4277352

Grzywacz, J. G., & Marks, N. F. (2000). Family, work, and work-family spillover, and problem drinking during midlife. *Journal of Marriage and the Family*, 62, 336–348. doi:10.1111/j.1741-3737.2000.00336.x

Lugaila, T. (1998). *Marital status and living arrangements: March 1998 (Update)*. U.S. Bureau of the Census, *Current Population Reports, Series P20-514*. Washington, DC: U.S. Government Printing Office.

MacEwen, K. E., & Barling, J. (1994). Daily consequences of work interference with family and family interference with work. *Work and Stress*, 8, 244–254. doi:10.1080/02678379408259996

Nelson, C. C., Li, Y., Sorensen, G., & Berkman, L. F. (2012). Assessing the relationship between work-family conflict and smoking. *American Journal of Public Health*, 102, 1767–1772. doi:10.2105/AJPH.2011.300413

Ng, D. M., & Jeffrey, R. W. (2003). Relationships between perceived stress and health behaviors in a sample of working adults. *Health Psychology*, 22, 638–642. doi:10.1037/0278-6133.22.6.638

Rose, J. S., Chassin, L., Presson, C. C., & Sherman, S. J. (1996). Demographic factors in adult smoking status: Mediating and moderating influences. *Psychology of Addictive Behaviors*, 10, 28–37. doi:10.1037//0893-164X.10.1.28

Schwartz, J., Pieper, C., & Karasek, R. (1998). A procedure for linking psychosocial job characteristic data to health surveys. *American Journal of Public Health*, 78, 904–909. doi:10.2105/AJPH.78.8.904

Wang, J., Afifi, T. O., Cox, B., & Sareen, J. (2007) Work-family conflict and mental disorders in the United States: Cross-sectional findings from the National Comorbidity Study. *American Journal of Industrial Medicine*, 50, 143–149. doi:10.1002/ajim.20428

Wang, M., Liu, S., Zhan, Y., & Shi, J. (2010). Daily work-family conflict and alcohol use: Testing the cross-level moderation effects of peer drinking norms and social support. *Journal of Applied Psychology*, 95, 377–386. doi:10.1037/a0018138