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Social Support and Prenatal Alcohol Use

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Abstract

Background—Lack of social support during pregnancy may be associated with the prenatal use of alcohol. The purpose of this study is to evaluate the degree, predictors, and consequences of social support in a cohort of 200 pregnant women who scored 2 or more on the T-ACE, a 4-item screening questionnaire for prenatal drinking.

Methods—The pregnant women completed the Maternal Social Support Index (MSSI). Their partners completed the same measure, which was modified to reflect their status as the biological fathers.

Results—Despite having similar overall MSSI scores, there was only slight to fair agreement on the level of support received by the pregnant women for most daily tasks when their responses were compared with their partners. Predictors of increased maternal social support included the woman's being married and having more education and a more prestigious job than her partner. Social support was not predictive of either subsequent prenatal alcohol use or newborn birth weight.

Conclusions—Regardless of social support, previous, prepregnancy, and early pregnancy drinking were the most predictive factors for subsequent prenatal alcohol consumption in this sample, underscoring the importance of screening pregnant women for drinking.

INTRODUCTION

MATERNAL PSYCHOSOCIAL STRESS has been identified as an independent risk factor for preterm birth, low birth weight, and other pregnancy complications.^{1–3} The adverse impact of such stress, however, can be ameliorated by social support, defined as the psychological, emotional, and material assistance offered by the social network of family, friends, and community.⁴ For example, women with multiple types of social support from different sources have been found to have higher birth weight infants.⁵ Similarly, an association between the extent of assistance with daily tasks in the prenatal household and newborn birth weight has been reported.⁶

Some have reported a potential relationship between the lack of social support during pregnancy and the use of alcohol and other substances.^{4,7} Among pregnant teenagers and postpartum adolescents, stress and social support have been shown to be important mediators for the development of depressive symptoms and the use of alcohol and drugs.^{8,9} A longitudinal study of 139 pregnant women found that those who were binge drinkers were

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more likely to be older, smoke cigarettes, and have more social isolation, as measured by the Maternal Social Support Index (MSSI).¹⁰ On the other hand, the lack of a difference between pregnant drug abusers and nonabusers in terms of social support has also been described.⁴

The purpose of this study is to evaluate the degree, predictors, and consequences of social support in a cohort of 200 pregnant women who scored 2 or more on the T-ACE, a 4-item screening questionnaire for prenatal drinking. Social support was measured with the MSSI for the pregnant women and contrasted with the results of a parallel assessment of their male partners.¹¹ Sociodemographic characteristics of the pregnant women were considered as possible predictors that could influence the extent of social support they received. Finally, the degree of social support, as well as prior drinking habits and sociodemographic measures, were examined for their subsequent impact on drinking during pregnancy and on infant birth weight.

MATERIALS AND METHODS

Subjects were 200 pregnant women drawn from a larger study of 304 T-ACE-positive women and individuals who were knowledgeable about their health habits and would serve as their support partners. In this study, the sample was limited to include only those women whose male partners were their husbands or the biological fathers of the index pregnancy and who provided data about maternal social support. Overall, women were considered to be eligible if they scored 2 or more on the T-ACE and were at risk for drinking because of current alcohol consumption while pregnant, drinking during a previous pregnancy, or drinking in excess of sensible drinking limits when not pregnant; additional details are available elsewhere.^{12,13}

The pregnant women completed the MSSI at the time of study enrollment. Most women enrolled with a median gestation of 11.5 weeks (range 4–27). The MSSI is an 18-item multidimensional assessment of social support across seven domains and has been validated and used in research studies since 1981.^{11,14} Scores can range from 0 to 39, with higher scores indicating greater levels of social support. The seven domains measured are (1) MSSI 1, help with daily tasks, questions 1–10, (2) MSSI 2, satisfaction with visits from kin, question 12, (3) MSSI 3, help with crises, questions 11 and 13, (4) MSSI 4, emergency child care, question 14, (5) MSSI 5, satisfaction with communication from her male partner, question 15, (6) MSSI 6, satisfaction with communication from another support person, question 16, and (7) MSSI 7, community involvement, questions 17 and 18 (Table 1). In addition to calculating a total overall MSSI score for the women, several domains (MSSI 2, MSSI 3, MSSI 4, and MSSI 6) were combined to create a composite score reflecting social support from people other than the partner.

The subjects' male partners completed a version of the MSSI that was modified to reflect their status as expectant fathers. In particular, the men's responses to the 10 items constituting MSSI 1, help with daily tasks, were compared with the women's responses (e.g., women reporting no help with a task vs. partners' report of help with that task) using the kappa statistic.

Information about the subjects' age, race, marital status, occupation, years of education, parity, and prepregnancy drinking was also obtained at study enrollment. Subjects were given the Timeline Follow Back interview to obtain a detailed drinking history (average number of drinks per drinking day and percentage of drinking days) for the 6 months prior to enrollment.¹⁵ Alcohol consumption for the subjects was thus being obtained for three time periods: prepregnancy (average of 79 days), early pregnancy before study enrollment (average of 104 days), and prenatal consumption subsequent to study enrollment (average of 158 days). Subjects were asked to estimate the number of years they had been consuming alcohol on a regular basis. They estimated a mean of 3.7 years of regular alcohol use, which was then converted to a percentage of the subject's lifetime to allow ease of comparison between

subjects. The occupations of the women and their partners were coded according to the 1989 General Social Survey (GSS) prestige scales, a form of the Hodge-Siegel-Rossi ratings of occupational prestige later updated by Hodge, Treas, and Nakao.¹⁶ The occupational prestige ratings range from 17 (e.g., miscellaneous food preparation occupations) to 86 (e.g., physicians).

Three potential outcomes of social support were examined. Infant birth weights were abstracted from the medical record as the most accessible measure of birth outcome, given the relative infrequency of fetal alcohol syndrome and the delayed manifestations of fetal alcohol effects. The average number of drinks per drinking day and the percentage of drinking days after study enrollment until delivery were calculated from the Timeline Follow Back interview administered to subjects at their postpartum visit. The postpartum interview covered the interval subsequent to study enrollment until delivery.

Data analysis

The overall MSSSI score was calculated for each participant, and Cronbach's coefficient alpha was computed to determine the internal consistency and reliability of the scale. An alpha value of ≥ 0.70 is considered to be acceptable when measuring a single, unidimensional construct, and lower values are acceptable for data with a multidimensional structure.¹⁷ For each of the daily task items (MSSSI 1), the percentages of women receiving no support (e.g., score of 0 on the item) and any support were calculated. The extent of agreement about support given to the women between the women and their partners was quantified by calculating the kappa index of agreement for the 10 items about help with daily tasks (MSSSI 1). Kappa is an index of agreement for two observers, with a correction made for chance, and varies from values of -1 to 1 , with 0 signifying that agreement is no better than chance.¹⁸

Multivariable linear regression was used to relate independent predictor variables to several dependent variables. The independent predictor variables were the women's sociodemographic characteristics (e.g., age, race, education, marital status, occupational prestige differential between the woman and her partner) and drinking variables that have been shown in other studies to be predictors of prenatal alcohol use (e.g., prepregnancy drinking, pregnancy drinking prior to study enrollment, lifetime alcohol use). The dependent variables were the overall MSSSI score and then the three outcome variables, prenatal drinking subsequent to enrollment (quantity and frequency) and birth weight. The MSSSI score was included as a predictor variable in the regressions for the three outcome variables. All the predictors were entered simultaneously into the models. One of the predictors, occupational prestige differential, was calculated by subtracting the partner's occupational prestige from the subject's occupational prestige. A prestige differential of 0 meant that the couple's current professions had equal prestige, and a positive differential meant that the woman's job was more prestigious than her partner's. There was 90% power to detect correlations of 0.23 or larger between the primary predictor, the MSSSI score, and any of the three outcomes, quantity and frequency of prenatal alcohol use and birth weight, with the sample of 200 subjects available for analysis. SAS 8.2 (SAS Institute, Cary, NC) was used for these analyses, and two-sided p values < 0.05 were considered to be statistically significant.

RESULTS

Most of the couples were married (86.8%). The women were somewhat younger than their partners (respective median ages 31.5 vs. 33.0 years). The women were well educated, having a median of 16.3 years of formal education. Most were of European American descent (81.7%), with 5.2% self-reporting as African American and 13.1% as Asian and other, including unknown. Less than half (45.4%) were expecting their first child. Median household income based on home ZIP code was \$55,357; the average median household income for Massachusetts

in the study time period was \$50,587.¹⁹ The women had a high rate of employment outside the home, with 83.7% reporting a usual paid occupation in the past 3 years. The mean occupation prestige rating was 56.1 (e.g., dietitian, SD 12.6) when women in unpaid pursuits were excluded; the rating dropped to 47.0 (e.g., musician, SD 23.8) when all were included. Similarly, 92.6% of the partners were employed in the past 3 years, with a mean occupational prestige rating of 53.2 (e.g., postmaster, SD 15.1) when unpaid pursuits were excluded and 50.5 (e.g., electrician, SD 18.8) when all were included.

The mean MSSSI score for the women was 25 (SD 3.6) for the women and 29 (SD 4.0) for the partners. Results focus on the women's responses, as the MSSSI modified for partners has not been previously tested. Table 1 shows that the mean score for help with daily tasks (MSSI 1) was 7.4 (SD 1.4) out of a maximum possible score of 10. The mean score for the composite measure reflecting social support from sources other than the partner (MSSI 2, MSSI 3, MSSI 4, and MSSI 6) was 11.7 (SD 2.0) out of a maximum possible score of 17. The mean score for community involvement (MSSI 7) was 4.2 (SD 2.3) out of a possible maximum of 8. The mean score given by the women with regard to satisfaction with partner communication (MSSI 5) was 1.4 (SD 0.6) out of a possible maximum of 4 points. The Cronbach's coefficient alpha measure of internal consistency for the overall scale was 0.38: 0.51 for help with daily tasks (MSSI 1), 0.02 for the composite measure of social support from sources other than the partner (MSSI 2, MSSI 3, MSSI 4, and MSSI 6), and 0.48 for community involvement (MSSI 7).

Table 1 also shows the proportions of women who reported that they received help, wholly or in part, with the specific daily tasks constituting MSSI 1. Kappa agreement coefficients were moderate for such tasks as fixing meals, grocery shopping, and bill paying when the subjects' answers were compared with their partners. Strength of agreement for the other items varied from slight ($\kappa = 0-0.20$) to fair ($\kappa = 0.21-0.40$).

Predictors of maternal social support, prenatal alcohol consumption, and birth weight are summarized in Table 2. Subject characteristics that increased overall maternal social support were the woman's being married ($p = 0.02$), having more education ($p = 0.01$), and having a job that was more prestigious than her partner's ($p = 0.003$). On the other hand, two other characteristics decreased social support: first pregnancy ($p = 0.09$) and increased woman's age ($p = 0.04$).

The mean number of prenatal drinks after enrollment was 0.4 drinks per drinking day (SD 0.5, range 0-3 drinks) and the mean percent drinking days was 2.0% (SD 4.8, range 0-47%). Median birth weight was 3345 g (range 1219-4879). Social support as measured by the total MSSSI score was not predictive of prenatal alcohol use or birth weight. Early pregnancy drinking prior to study enrollment was most predictive of subsequent consumption, whether measured by quantity ($p = 0.03$) or frequency ($p < 0.0001$). Marital status predicted prenatal drinks per drinking day ($p = 0.05$), whereas lifetime alcohol use predicted percent prenatal drinking days ($p = 0.03$).

DISCUSSION

The main findings of this study are that maternal social support, as measured by the MSSSI, was not predictive of either subsequent prenatal alcohol use or newborn birth weight. This is consistent with results from some other researchers, who have attempted to evaluate the possible contribution of social support in prenatal alcohol use, but in contrast to another study, which found that binge drinking pregnant women were more socially isolated.^{4,7,10} Previous, prepregnancy, and early pregnancy drinking were the most predictive of subsequent prenatal alcohol consumption in this sample.

One of the challenges in elucidating the role of social support in pregnancy outcome may be its measurement. Although some have proposed that social support is perceived as unidimensional, thus rendering a more finely grained measure unnecessary, social support has at least two components, emotional and instrumental.²⁰ Perceptions of social support, moreover, may not always reflect the full extent for which there is need or access.⁵ This study not only used a multidimensional measure of support but also sought to compare reports about help with daily tasks from the pregnant women and their partners. In general, there was only slight to fair agreement on the level of support received by the pregnant women for most daily tasks when their responses were compared with their partners' responses. This discrepancy may represent a disconnect between what pregnant women need and what partners think is provided in terms of support. Predictors of increased maternal social support included the woman's being married and having more education and a more prestigious job than her partner. The Cronbach's alpha values were low, perhaps reflecting the multidimensional structure of data.²¹

Potential limitations to study findings include the administration of the MSSSI to partners in a modified format that has not been otherwise tested. On the other hand, as previous studies of social support have relied exclusively on self-reports, comparison with another household member was desirable. Interrater reliability for the MSSSI measures of community and other social support was not possible. Another potential limitation is that social support was not measured again after delivery. As half the women were expecting their first child, their anticipated level of support may have differed from what actually occurred because some of the MSSSI items asked about child care (e.g., items 8 and 9) and were answered before delivery. Study participants were well educated, with high rates of employment, limiting generalizability of findings to others with similar material advantages. More education and employment, however, are also associated with higher rates of prenatal alcohol use.²²

With respect to prenatal alcohol use, most participants reported low levels of consumption after enrollment. There are several possible explanations. First, half of pregnant women will spontaneously reduce their alcohol use.²³ Second, study subjects have been shown to react to alcohol assessment protocols by drinking less.²⁴ Third, they may not have given accurate reports on the quantity and frequency of prenatal alcohol use after enrollment. Nonetheless, as no level of prenatal alcohol use is safe, the reductions overall were desirable.²⁵

Although social support was not predictive of prenatal alcohol use, study results may reflect larger, secular trends. The America Time Use Survey of 21,000 individuals chronicling an average day in 2003 found that whereas employed men worked about an hour more than employed women (8.0 vs. 7.1 hours), employed women spent more time per day than employed men doing household activities (2.4 vs. 1.4 hours). In households with children under the age of 18, women spent more time providing child care (1.7 vs. 0.8 hours from men).²⁶

Thus, in this sample of well-educated and employed pregnant women and their partners, social support was not predictive of prenatal alcohol use. Rather, prior use and early pregnancy drinking were the most predictive of subsequent prenatal consumption, underscoring the importance of screening pregnant women for drinking. Future research may involve comparison between reports of social support by household members, improving ascertainment of social support, obtaining serial, multiple measures of social support throughout pregnancy in order to better discern its potential impact, and including participants with fewer apparent material advantages.

References

1. Ruiz RJ, Fullerton J, Dudley DJ. The interrelationship of maternal stress, endocrine factors, and inflammation on gestational length. *Obstet Gynecol Surv* 2003;58:415. [PubMed: 12775946]

2. Hobel C, Culhane J. Role of psychosocial and nutritional stress on poor pregnancy outcome. *Am J Clin Nutr* 2003;133:1709s.
3. C'deBac J, Lapham SC, Skipper BJ, Watkins ML. Use of computer interview data to test associations between risk factors and pregnancy outcomes. *Comput Biomed Res* 1997;30:232. [PubMed: 9281330]
4. Degen HM, Myers BJ, Williams-Petersen MG, Knisely JS, Schnoll SS. Social support and anxiety in pregnant drug abusers and nonusers: Unexpected findings of few differences. *Drug Alcohol Depend* 1993;32:37. [PubMed: 8486083]
5. Feldman PJ, Dunkel-Schetter C, Sandman CA, Wadhwa PD. Maternal social support predicts birth weight and fetal growth in human pregnancy. *Psychosom Med* 2000;62:715. [PubMed: 11020102]
6. Pascoe JM, Chessare J, Baugh E, Urich L, Ialongo N. Help with prenatal household tasks and newborn birth weight: Is there an association? *J Dev Behav Pediatr* 1987;18:207. [PubMed: 3611361]
7. Haynes G, Dunnagan T, Christopher S. Determinants of alcohol use in pregnant women at risk for alcohol consumption. *Neurotoxicol Teratol* 2003;25:659. [PubMed: 14624964]
8. Barnett B, Duggan AK, Wilson MD, Joffe A. Association between postpartum substance use and depressive symptoms, stress, and social support in adolescent mothers. *Pediatrics* 1995;96:659. [PubMed: 7567327]
9. Barnett B, Joffe A, Duggan AK, Wilson MD, Repke JT. Depressive symptoms, stress, and social support in pregnant and postpartum adolescents. *Arch Pediatr Adolesc Med* 1996;150:64. [PubMed: 8542009]
10. Pascoe JM, Kokotailo PK, Broekhuizen FF. Correlates of multigravida women's binge drinking during pregnancy: A longitudinal study. *Arch Pediatr Adolesc Med* 1995;149:1325. [PubMed: 7489068]
11. Pascoe JM, Ialongo NS, Horn WF, Reinhart MA, Perradatto D. The reliability and validity of the Maternal Social Support Index. *Fam Med* 1988;20:271. [PubMed: 3203834]
12. Sokol RJ, Martier SS, Ager JW. The T-ACE questions: Practical prenatal detection of risk-drinking. *Am J Obstet Gynecol* 1989;160:863. [PubMed: 2712118]
13. Chang G, McNamara TK, Orav EJ, et al. Brief intervention for prenatal alcohol use: A randomized trial. *Obstet Gynecol* 2005;105:991. [PubMed: 15863535]
14. Pascoe JM, Loda FA, Jeffries V, Earp JA. The association between mothers' social support and provision of stimulation to their children. *J Dev Behav Pediatr* 1981;2:15. [PubMed: 7276175]
15. Sobell LC, Sobell MC. Timeline Follow Back: A technique for assessing self-reported alcohol consumption. In: Allen, JP, Litten RZ, eds. *Measuring alcohol consumption: Psychosocial and biochemical methods*. Totowa, NJ: Humana Press, 1992:41.
16. Nakao K, Treas J. Computing 1989 prestige scores. *GSS Methodological Report No. 70*. Chicago, IL: NORC, 1990.
17. Hatcher L. A step-by-step approach to using the SAS system for factor analysis and structural equation modeling. Cary, NC: SAS Institute, 1994:130.
18. Feinstein AR. *Clinical epidemiology: The architecture of clinical research*. Philadelphia, PA: WB Saunders, 1985:184.
19. DeNavas WC, Cleveland R, Webster BH Jr. *Income in the United States: 2002*. U.S. Census Bureau, Current Population Reports. Washington, DC: U.S. Government Printing Office, 2003:60. Available at www.census.gov/prod/2003pubs/p60-221.pdf Accessed January 26, 2005.
20. Orr ST. Social support and pregnancy outcome: A review of the literature. *Clin Obstet Gynecol* 2004;47:847.
21. UCLA Academic Technology Services. SPSS FAQ, What does Cronbach's alpha mean? www.ats.ucla.edu/sata/spss/faq/alpha.htm Accessed June 1, 2005.
22. Centers for Disease Control and Prevention. Alcohol use among women of childbearing age—United States, 1991–1999. *MMWR* 2002;51:273. [PubMed: 11952279]
23. Smith IE, Lancaster JS, Moss-Wells S. Identifying high-risk pregnant drinkers: Biological and behavioral correlates of continuous heavy drinking during pregnancy. *J Stud Alcohol* 1987;48:304. [PubMed: 3613580]
24. Clifford PR, Maisto SA. Subject reactivity effects and alcohol treatment outcome research. *J Stud Alcohol* 2000;61:787. [PubMed: 11188483]

25. Office of the Surgeon General. Press release: U.S. Surgeon General Releases Advisory on Alcohol Use in Pregnancy. February 21, 2005. Available at www.hhs.gov/surgeongeneral/pressrelease/sg02222005.html Accessed August 12, 2005.
26. United States Department of Labor, Bureau of Labor Statistics. America Time Use Survey. www.bls.gov/news.release/tus Accessed April 18, 2005.

Table 1

Maternal Social Support Index

Item	% receiving support	Kappa	Mean score (SD)
MSSI 1: Help with daily tasks, items 1–10			7.4 (1.4)
1. Who fixes meals?	59.0	0.56	
2. Who does the grocery shopping?	54.5	0.56	
3. Who lets your children know what is right and wrong?	91.0	0.093	
4. Who fixes things around the home?	92.5	0.17	
5. Who does the inside cleaning?	56.5	0.20	
6. Who works outside around the home?	96.0	0.27	
7. Who pays the bills?	61.0	0.36	
8. Who takes your child to the doctor if he or she is sick?	43.0	0.56	
9. Who sees to it that your children go to bed?	79.5	0.56	
10. Who takes care of car problems on short notice?	84.5	0.36	
MSSI 3: Help with crises, items 11 and 13			
11. If no car, can you get one in a few hours if needed?			
13. How many people can you count on in times of need?			
MSSI 2: Satisfaction with visits from kin, item 12			5.2 (1.3)
12. a. How many relatives do you see once a week or more often?			2.9 (1.0)
b. Would you like to see your relatives: more/less/just right?			
MSSI 4: Emergency child care, item 14			1.9 (0.4)
14. a. How many people would be able to take care of your children for several hours if needed?			
b. How many people are from your neighborhood?			
MSSI 5: Satisfaction with communication from partner, item 15			1.4 (0.6)
15. a. Do you have a boyfriend or husband?			
b. If yes, how happy are you in the way that [he] lets you know what he thinks or feels?			
MSSI 6: Satisfaction with communication from another support person, item 16			0.8 (1.0)
16. a. Are there adults, not including your boyfriend or husband, with whom you have regular talks?			
b. If yes, think about the person you talk with most. Are you happy with the talks that you have with this person?			
MSSI 7: Community involvement, items 17 and 18			4.2 (2.3)
17. How often do you attend meetings of the following groups (e.g., religious, educational, social, political)?			
18. Are you a member of any committee, or do you have any other duties in any of your groups?			

Table 2
Predictors of Social Support, Alcohol Consumption, and Birth Weight (N = 200)

<i>Predictor</i>	<i>Social support</i>		<i>Drinks per drinking day</i>		<i>% drinking days</i>		<i>Birth weight</i>	
	<i>b</i>	<i>p</i>	<i>b</i>	<i>p</i>	<i>b</i>	<i>p</i>	<i>b</i>	<i>p</i>
Intercept	23.9	<0.0001	-0.11	0.81	-6.1	0.042	3108.1	<0.0001
Occupational prestige differential	0.02	0.003	-0.001	0.54	-0.011	0.25	-1.31	0.44
Early pregnancy drinking ^a	—	—	0.14	0.03	0.47	<0.0001	1.92	0.79
African American	-0.29	0.82	0.19	0.35	-1.5	0.27	-1.51	0.99
First pregnancy	-0.89	0.09	-0.095	0.29	-0.41	0.50	-43.3	0.70
Subject's age (per decade)	-0.11	0.04	0.00	0.27	0.008	0.20	0.36	0.77
Married	1.8	0.02	0.26	0.05	0.19	0.83	185.7	0.25
Subject's education (years)	0.02	0.01	0.00	0.55	0.01	0.26	-1.8	0.31
Subject's lifetime alcohol use ^b	-0.07	0.64	0.050	0.06	0.40	0.03	4.77	0.89
Social support index	—	—	-0.014	0.22	0.062	0.40	13.0	0.35

^a Prenatal alcohol consumption prior to study enrollment.

^b Subject's regular alcohol use converted to a percentage of her lifetime in years.