

Résumé

**Les adultes ayant un parent alcoolique
ont-ils une santé précaire?
Une comparaison de trois groupes
visant à repérer la présence de biais
dans l'auto-signallement**

Kenneth E. Hart, Dorrie L. Fiissel et Margaret McAleer

Cette étude vise à déterminer si les adultes ayant un parent alcoolique [adult offspring of alcoholics (AOA)] en traitement ont une santé relativement précaire. Un échantillonnage de AOA et deux groupes de référence se sont soumis à un protocole dont le but était d'évaluer le signalement de problèmes de santé ayant été diagnostiqués par un médecin ainsi que les perceptions des participants concernant une symptomatologie médicale mineure. La névrose-stabilité (tonus mental négatif) est le trait de personnalité utilisé comme covariable statistique, en combinaison avec des variables démographiques choisies qui correspondent, selon les données, à la condition des AOA. Une analyse des covariables a révélé que les AOA signalent un plus grand nombre de problèmes de santé graves diagnostiqués par un médecin, comparativement aux participants des groupes de contrôle traités et non traités. Les résultats des trois groupes étaient semblables en termes de signalement de symptômes mineurs lorsqu'il y avait contrôle du facteur névrose-stabilité. Toutefois, lorsque la névrose n'était pas utilisée comme covariable, les groupes affichaient des résultats différents en termes de symptômes mineurs, ce qui suggère un état de santé plus précaire chez les AOA. Les résultats soutiennent, de façon partielle et préliminaire, la thèse selon laquelle la vie dans un milieu alcoolique à l'étape de l'enfance et de l'adolescence est liée à la manifestation de problèmes médicaux graves à l'âge adulte. Les résultats indiquent que les études sur les AOA qui ont recours à un protocole d'auto-signallement de symptômes physiques mineurs doivent tenir compte du biais associé à la personnalité névrosée pouvant influencer l'auto-signallement.

Mots clés : adultes ayant un parent alcoolique, santé physique, santé, biais associé à la personnalité névrosée, biais pouvant influencer l'auto-signallement

Do Adult Offspring of Alcoholics Suffer from Poor Medical Health? A Three-Group Comparison Controlling for Self-Report Bias

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This study examined whether adult offspring of alcoholics (AOAs) who are in treatment have relatively poor medical health. A clinical sample of AOAs and 2 comparison groups completed measures that assessed reports of physician-diagnosed health problems and participant perceptions of minor medical symptomatology. The personality trait of neuroticism-stability (negative affectivity) served as a statistical covariate together with selected demographic variables found to correlate with AOA status. Results of analysis of covariance showed that AOAs reported a greater number of physician-diagnosed serious health problems than both treatment and non-treatment controls. The 3 groups did not differ in terms of minor symptom reports when neuroticism-stability was controlled. However, when neuroticism was not covaried, the groups differed in terms of minor symptoms, suggesting poorer health among AOAs. In general, the results were interpreted as providing partial and preliminary support for the contention that living in an alcoholic environment during childhood and adolescence plays a role in the manifestation of serious medical problems in adulthood. The results also suggest that future studies of AOAs that utilize self-report measures of minor physical symptoms should control for the self-report bias associated with the personality trait of neuroticism.

Keywords: adult offspring of alcoholics, adult children of alcoholics, physical health, medical health, neuroticism bias, self-report bias

Prior to the publication of Sullivan and Handley's (1993) landmark article "Alcohol and Drug Abuse," alcohol abuse was a much neglected concern for nursing theory, research, and practice. A survey of the concerns of medical-surgical nurses caring for hospitalized alcoholics found that a priority was the negative impact of patients' drinking on the well-being of their offspring (Bartek, Lindeman, Newton, Fitzgerald, & Hawks, 1988). This concern is shared by pediatric nurses, who are concerned with fetal alcohol effects, and by other providers of health care to children and adolescents (e.g., Anonymous, 2002; Bartek, Lindeman, & Hawks, 1999). Ideally, assistance to disadvantaged people such as the offspring of alcoholics should be driven by approaches that are rooted in evidence. While preliminary research with the offspring of alcoholics has

been conducted in the field of nursing (Bartek et al., 1999; Emshoff, 1999; Gournay, 2001; Haack, 1990; Johnson, 1999; Kumpfer, 1999; Tweed, 1997; Tweed & Ryff, 1996), much remains to be done. Best-practice nursing care for alcohol-affected families requires that nurses and allied health professionals be aware of how parental alcohol abuse can affect the well-being of offspring. The present study sought to provide an empirical basis for enhancing nurses' readiness and ability to detect health problems in offspring of alcoholics in a timely fashion. Research in this area may eventually contribute to improved quality of service to AOAs in the prevention and management of illness.

A recent epidemiologic study found that the proportion of children and adolescents affected by family alcohol problems ranged from 15% to 43%. These estimates, which vary as a function of the time frame used, are derived from interview data from an impressive study of over 42,000 households in the United States (Grant, 2000). Briefly, this study found that 43% of children (28 million) had been exposed at some time before the age of 18 to familial alcohol dependence (alcoholism), alcohol abuse, or both. For the year 1992 alone, it was estimated that approximately 15% of offspring under age 18 (10 million children) were exposed to familial alcohol abuse or dependence. There is every reason to believe that prevalence figures in Canada approximate the US estimates. These data suggest that the negative familial effects of alcohol abuse are likely to be very widespread.

A growing body of research has specified the nature of these adverse effects. Evidence suggests that parental alcoholism can have consequences for the physical health, emotional well-being, and behavioural adjustment of offspring. In short, findings suggest that offspring of alcoholics suffer negative consequences in many domains. Furthermore, some of these consequences may persist throughout childhood and into adulthood. For example, one of the most consistent findings in the literature is that children of alcoholics are at increased risk of developing alcoholism as well as other substance-abuse problems (Cuijpers, Langendoen, & Bijl, 1999; Harter, 2000; Jacob & Windle, 2000; Jacob, Windle, Seilhamer, & Bost, 1999; Myland, Idle, Cuevas, & Meehan, 2002; Sher, 1997; West & Prinz, 1987). Children from alcoholic families have also been shown to have higher rates of depression, anxiety, phobias, panic disorders, schizophrenia, and eating disorders (Cuijpers et al.; Harter; Jacob & Windle; Mathew, Wilson, Blazer, & George, 1993; Myland et al.; Sher, 1997; West & Prinz). Furthermore, self-regulation deficits, antisocial symptoms, attention deficits, academic difficulties, and lower self-esteem have all been identified as characteristics of children of alcoholics relative to controls (Harter; Jacob et al.; Jacob & Windle; Mathew et al.; Sher).

While considerable research has examined the behavioural, emotional, and cognitive-social characteristics of children and adolescents of alcoholics (Ellis, Zucker, & Fitzgerald, 1997; Sher, 1997; Windle, 1997), relatively little attention has been given to the study of physical health and medical status. Even less is known about the medical status of *adult* offspring of alcoholics. Research that has examined health-care utilization rates has been interpreted as suggesting that children of alcoholics suffer from poor physical health. Roberts and Brent (1982), for example, examined physician-utilization rates among members of alcoholic families (excluding the alcoholic member) and found that they had a significantly greater number of visits to a physician per year than members of control families. Woodside, Coughy, and Cohen (1993), in a study involving health-insurance claims, investigated whether young children from alcoholic homes had higher hospitalization rates than those from non-alcoholic homes. Results showed that they had higher rates over a 3-year period. In addition, for each admission the duration of hospital stay was longer, suggesting that the offspring of alcoholics had more serious conditions. Finally, Dobkin, Tremblay, Desmarais-Gervias, and Depelteau (1994) compared physician-utilization rates for children with alcoholic fathers and children with non-alcoholic fathers and found no differences. Thus, results of this body of evidence are mixed.

Other studies have examined indicators of biomedical health status and medical symptom reporting. In one of the earliest of these, Roberts and Brent (1982) found that offspring of alcoholic families had significantly more medical diagnoses than controls. While Roberts and Brent conclude that "their higher rates of specific diagnoses suggest that [these offspring] are...less well than members of nonalcoholic families" (p. 125), Dobkin et al. (1994) conclude that the physical health of children of alcoholics is not worse than that of children of non-alcoholics. Thus, this body of evidence is also mixed.

To summarize, results from studies that have investigated health-care utilization rates and medical symptomatology provide only preliminary evidence to support the contention that offspring of alcoholics suffer from unusually low levels of physical health. Such a conclusion must be considered tentative, given the inconsistent pattern of results. Moreover, much of the research examining health in offspring of alcoholics is methodologically flawed, yielding results that are difficult to interpret with a sufficient degree of certainty. For example, given that offspring of alcoholics have higher psychiatric morbidity, the extent to which higher health-care utilization rates can be attributed to *medical* dysfunction per se is unclear. It is possible that the reasons for seeking medical care in studies published to date are *psychiatric* in nature. Also, even if research were to show conclusively that offspring of alcoholics seek care for

medical complaints more readily, it is possible to interpret differential physician utilization as reflecting differential symptom labelling and illness behaviour — in the absence of differential organic pathology. Such a cognitive and behavioural bias among offspring of alcoholics, if it exists, might lead physicians to “over-diagnose” illnesses among “hypochondriacal” individuals who are worried but well. Lack of proper control groups also opens the possibility that ill health and help-seeking behaviour are equally high in offspring of other types of dysfunctional families. If this is the case, the link to ill health may not be unique to alcoholic offspring status. A final limitation of this body of research is that no studies have examined *clinical* samples of AOAs. To date, research has tended to focus on non-clinical samples of young children and adolescents.

The present study sought to extend and refine the evidence base pertaining to the physical health status of AOAs by comparing and contrasting three samples of middle-aged adults — two clinical samples and one normal. The main group of interest was a clinical (i.e., treatment-seeking) sample of middle-aged AOAs who were attending or had attended psychotherapy or self-help support groups for AOA-related issues. The first comparison group was a clinical sample of distressed adults who were in treatment or who had availed themselves of mental health services for non-AOA-related issues. The second comparison group was a non-clinical sample of same-aged non-AOA adults who had not sought treatment.

In addition to utilizing multiple control groups, another methodological strength of the present study was that it assessed serious and minor health problems using a multidimensional measure with known reliability and validity (Moos, Cronkite, Billings, & Finney, 1984). In particular, we examined physician-diagnosed medical conditions as well as the subjective perception of minor physical symptoms (possible indicants of ill health). Finally, a variety of potential confounds were assessed and, where appropriate, statistically controlled.

One particular confounding factor that served as a primary covariate was the (normal) personality trait of neuroticism–stability (negative affectivity). An individual who scores high on negative affectivity is one who tends to experience negative emotions, distress, and upset. This construct is of interest to nursing researchers and health-care professionals because previous research shows that it is related to dissatisfaction with health and health complaints but *not* to actual biomedical disease (Watson & Pennebaker, 1989). Dispositional neuroticism is considered a particular threat to the internal validity of research with AOAs because previous studies show that: (1) AOAs score higher than controls on neuroticism (Jacob & Windle, 2000; Sher, Walitzer, Wood, & Brent, 1991); and (2) self-reports of physical health are confounded by (inflated) neuroticism (Brett,

Brief, Burke, George, & Webster, 1990; Jorgensen & Richards, 1989; Watson & Pennebaker). In addition to employing the personality trait of neuroticism as a statistical covariate to equate the three groups, we controlled for anxiety-related sources of response bias in our measure of minor medical symptoms. In particular, we removed selected physical symptom items from the minor health symptoms inventory that we judged as potentially tapping "distress-related" somatic anxiety. For example, we deleted the following items that are likely physical indicators of anxiety: "pounding heart," "hot and cold spells," "dizziness," "lump in throat," "nervousness," "restlessness," and "trembling." Again, we reasoned that the omission of these emotional-distress items would minimize confounding with anxiety-related response bias. Minimizing bias associated with distress was of particular concern because, as noted above, we anticipated that the AOA group would be more distressed than the comparison groups. Our intent, therefore, was to determine whether there are health differences among the three groups that cannot be explained by correlated differences in levels of emotional distress.

To summarize, the pilot study reported here sought to test the hypothesis that childhood exposure to an alcoholic home environment plays a role in the development of physical health problems that manifest in adulthood. Specifically, it was expected that, after statistically controlling for the biasing effects of neuroticism-related response bias and selected demographic confounds, AOAs would show more diagnosed health problems. It was also expected that AOAs would have more minor medical symptoms than participants in both of the control groups.

Method and Procedure

Participants

The initial pool of participants consisted of a convenience sample of 173 adults recruited through newspaper advertisements, flyers on bulletin boards, and personal and professional referrals in Long Island, New York, USA. The 173 participants formed three subgroups, two clinical samples (people who had sought psychological treatment) and one non-clinical sample (people who had not sought psychological treatment). Thirteen participants were excluded from the data set to maintain the validity of the differential group membership assignments. These 13 people were from the control groups and had tested positive on the screening question involving parental alcoholism. Thus, the total useable sample consisted of 160 adults forming three groups: (1) a clinical sample of treatment-seeking AOAs, (2) a clinical sample of treatment-seeking controls, and (3) a non-clinical sample of no-treatment controls. The first group consisted of 55 adults who were involved, either at the time of the study

or within the previous year, in AOA mutual-aid groups (Al-Anon, CODA, or ACA) or professional counselling/therapy for AOA-related issues. The second group consisted of 52 non-AOAs who were involved in professional counselling/psychotherapy at the time of the study or within the previous year for non-AOA-related issues. The third group consisted of 53 non-treatment adults employed by a high-school district, none of whom had been involved in mutual-aid groups or counselling/psychotherapy during the previous year and none of whom came from alcoholic family environments.

Data to support the construct validity of these "known groups" are provided below.

Instruments and Measures

Participants were treated in a manner consistent with American Psychological Association ethical guidelines. After signing the consent form, participants completed two research instruments that assessed different aspects of physical health. The first scale assessed participant reports of "diagnosed health problems" and the second assessed minor health symptoms ("perceived medical symptoms"). Participants also completed a variety of demographic and background variables describing their family of origin. They also completed a personality inventory that assessed individual differences in the trait known as neuroticism-stability. This personality measure served as a statistical control for neuroticism-related response bias, which is a threat to the validity of self-report measures of physical health. Where appropriate, selected demographic and background variables also served as covariates in analysis of covariance tests that compared the three groups in terms of physical health.

Criterion Measures

Participant reports of physician-diagnosed health problems. A slightly modified form of the Diagnosed Health Problems (DHP) subscale from Health and Daily Living Form B (HDL-B; Moos et al., 1984) was used to assess self-reported physician-diagnosed health problems. The DHP subscale of the HDL-B asked participants to report from memory whether a physician had diagnosed any of the medical conditions listed in the inventory within the previous year. The DHP HDL-B subscale includes "cancer," "chronic liver trouble," "diabetes," "serious back trouble," "high blood pressure," and "ulcers." Asthma and bronchitis, also from the HDL-B, were combined to form a "respiratory trouble" item. In addition, based on anecdotal reports culled from the clinical literature, we added "bowel trouble" and "reproductive-organ trouble." Thus, the scale consisted of nine items, to which participants responded Yes or No, so that scores on the modified DHP index could range from 0 to 9 (no

problems diagnosed to nine problems diagnosed). Reliability and validity evidence for the original DHP subscale of the HDL-B have been reported by Moos and colleagues (Cronkite & Moos, 1984; Moos et al.).

Perceived minor medical symptomatology. Self-perceptions of minor medical and physical symptomatology were assessed using an 11-item hybrid scale containing five items from the HDL-B (Moos et al., 1984) and six items from the Somatization subscale of the SCL-90-R (Derogotis, 1977). The Minor Medical Symptoms (MMS) subscale asked whether a symptom (e.g., "acid stomach" or "indigestion") was experienced "fairly often in the last 12 months." Participants responded Yes or No to each item (Yes = 1, No = 0). The following seven physical-symptom items from the SCL-90-R Somatization subscale were excluded: "pounding heart," "hot and cold spells," "dizziness," "lump in throat," "nervousness," "restlessness," and "trembling." We judged that these seven items might have been contaminated with emotional distress associated with somatic anxiety, and omitted them to minimize confounding our measure of physical health with response bias reflecting emotional health. Minimizing bias associated with this form of distress was of particular concern because we anticipated that the AOA group would be more distressed than the comparison groups. Removing these items allowed us to determine whether there were health differences among the three groups that could not be explained by correlated differences in levels of emotional distress. Thus, scores on the MMS index could range from 0 to 11. Internal reliability in the present study was satisfactory ($\alpha = .82$). The psychometric features of the original physical symptoms subscale of the HDL-B and the somatization scale of the SCL-90-R have been reported to be good (Cronkite & Moos 1984; Derogotis).

Potential Demographic/Background Confounds

In order to identify potential demographic confounds that might covary with AOA status, we obtained selective demographic and background information to describe the three groups. We identified variables on which group differences were found. These variables then became covariates in subsequent group comparisons testing for health differences. The demographic data are reported in Table 1. Analysis of variance showed that the three groups differed on age ($F = 8.34, p < .001$). Follow-up tests showed that no-treatment controls differed from both AOAs and treatment controls. As can be seen in Table 1, no-treatment controls were older. Chi-square analysis showed that group status was related to education ($\chi^2 = 29.0, p < .001$). Compared to the two control groups, a smaller percentage of AOAs were college graduates. Chi-square analysis showed that group status was related to family income ($\chi^2 =$

Table 1 *Demographic Data for the Three Groups*

	AOAs	Treatment Controls	No-Treatment Controls
Total number	55	52	53
Number of males	21	21	23
Number of females	34	31	30
Mean age	37	39	44
Number of whites	51	47	50
Number of non-whites	4	7	3
Percentage of college graduates	20	56	68
Percentage with income > \$40,000	61	82	92

23.0, $p < .01$). Specifically, as shown in Table 1, treatment controls had the highest income and AOAs the lowest. In terms of family income, the treatment controls fell midway between the two extremes. There were no significant differences among the three groups in terms of female:male ratio or ethnic/racial distribution.

Because age, education, and family income were all significantly related to group membership status, proper interpretation of results pertaining to the hypotheses had to be based on analyses that statistically control for these three sources of potential confounding. For this reason, we performed ANCOVAs in which age, education, and family income were entered as covariates.

Potential Psychological Confound

As noted above, individuals who score high on negative affectivity show a tendency to experience negative emotions, distress, and upset. This psychological construct is of interest to nursing researchers and health-care professionals because previous research shows that it is related to subjective dissatisfaction with health and health complaints but *not* to actual biomedical disease (Watson & Pennebaker, 1989). For this reason, dispositional neuroticism is considered a particular threat to the internal validity of nursing research involving self-reports of medical well-being.

Because of findings suggesting that the personality trait of neuroticism-stability systematically distorts self-reports of physical health status, medical problems, and physical symptomatology (Brett et al., 1990; Jorgensen & Richards, 1989; Watson & Pennebaker, 1989), participants were asked to complete the Negative Emotionality subscale from the Multidimensional Personality Questionnaire (MPQ; Tellegen, 1982). This scale consists of 14 items that tap individual differences in disposition to

experience feelings of nervousness, apprehension, sensitivity, and emotional lability, and has been shown to be both valid and reliable (Watson & Pennebaker). In the present study, an alpha of .88 was found, indicating a high level of internal consistency.

To examine whether group differences existed in terms of neuroticism-related response bias, an ANOVA was conducted. This analysis was significant ($F = 12.8, p < .001$). Follow-up analyses revealed that the two control groups did not significantly differ from one another ($M = 4.8$ and $3.9, SD = 3.5$ and 3.4 for treatment and no-treatment controls, respectively). However, AOAs ($M = 8.0, SD = 3.6$) had significantly higher scores than both control groups. Thus, neuroticism represented a potential confound and was statistically controlled in further analyses.

Validity Checks on Group Membership

History of parental alcoholism. It was assumed that, relative to the two control groups, participants in the AOA treatment group would have had greater exposure to an environment of parental alcoholism. In order to ensure the accuracy and integrity of this assumption (i.e., "known groups validity"), participants in all three groups were asked to respond to the following question: "During your childhood, from birth to age 18, was either your mother or father alcoholic?" (yes = 1, no = 0). As noted earlier, 13 subjects who were not in the AOA group screened positive for this question. After these subjects were excluded from the data set, chi-square analysis showed that the three groups differed, as expected, in terms of history of parental alcoholism ($\chi^2 = 47.6, p < .001$). Dunn-Bonferroni comparisons revealed that the AOA group had a significantly higher score than the treatment and no-treatment controls. This finding supports the accuracy and integrity of the group membership assignment by indicating that participants in the AOA group had been differentially exposed to parental alcoholism during their formative years.

History of family dysfunction. History of family dysfunction was assessed by having all participants respond to the following question: "During your childhood, from birth to age 18, did your parents have serious marital difficulty?" (yes = 1, no = 0). Chi-square analysis showed that the three groups differed in terms of history of family dysfunction ($\chi^2 = 35.2, P < .001$). Dunn-Bonferroni comparisons revealed that the AOA group had a significantly higher score than the treatment and no-treatment controls. These findings support the accuracy and integrity of the group membership assignment by indicating that participants in the AOA group did indeed come from families that were more "dysfunctional" than the families of control participants.

History of treatment utilization. History of treatment-seeking behaviour was assessed by having all participants respond to the following

question: "Indicate the total amount of time you have spent in counseling, psychotherapy, or self-help programs [e.g., individual, marital, family, group counseling/therapy, or AA, AL-Anon, or other self-help 12-step groups]: (1) none, (2) less than one year, (3) one year and less than two years, (4) two years and less than three years, (5) more than five years." Chi-square analysis showed that the three groups differed in terms of history of treatment utilization ($\chi^2 = 14.21, P < .001$). Whereas the means for the two treatment-seeking groups did not differ ($p > .05$), both of these groups differed from no-treatment controls (both p 's $< .001$). These data serve to validate group membership status by confirming that participants in the AOA treatment group and the treatment control group were both *clinical* samples who had sought and received professional mental health services to a degree greater than the normal control group.

Results

To examine the levels of physical health among the three groups, analyses of covariance (ANCOVAs) were conducted on the two indices of physical health (Diagnosed Health Problems and Minor Medical Symptomatology), with age, education, income, and neuroticism as the covariates.

Reports of Diagnosed Health Problems

The ANCOVA for participant reports of physician-diagnosed health problems was significant ($F = 18.03, p < .001$). The mean number of diagnosed health problems for each of the three groups can be seen in Table 2. Follow-up analyses revealed that the AOA group had a greater number of diagnosed health problems than the treatment control group ($F = 13.9, p < .001$) and the no-treatment control group ($F = 15.0, p < .001$). The two control groups, however, did not differ from one another ($F = .85, ns$).

	Diagnosed Medical Problems*		Reported Physical Symptoms	
	Mean	SD	Mean	SD
AOA treatment group	1.30	1.2	4.60	3.0
Non-AOA treatment controls	.52	1.0	2.60	2.8
No-treatment controls	.47	0.8	1.60	2.1

* Physician diagnosis as reported by participant.

Although we did not set out to compare the three groups in terms of specific types of diagnosed health problems, we did have the data and felt that this question merited post-hoc exploration. To explore which specific health problems discriminated the three groups, we conducted a series of chi-square analyses comparing proportions of respondents in each group reporting specific conditions. Results showed that the three groups differed on high blood pressure ($\chi^2 = 6.26, p < .05$), ulcers ($\chi^2 = 9.62, p < .01$), serious back trouble ($\chi^2 = 8.45, p < .05$), and bowel trouble ($\chi^2 = 9.99, p < .01$). A greater percentage of AOAs reported these problems than participants in either control group. Specifically, 22% of AOAs reported that a physician had diagnosed them as hypertensive in the previous year (12 of 55 respondents), compared to only 6% of treatment controls (3 of 52 respondents) and 11% of no-treatment controls (6 of 53). Ulcers had been diagnosed in 16% of AOAs (9 of 55), 2% of treatment controls (1 of 52), and 4% of no-treatment controls (2 of 53). A diagnosis of serious back trouble was reported by 25% of AOAs (14 of 55) but only 10% of treatment controls (5 of 52) and 8% of no-treatment controls (4 of 53). Lastly, 27% of AOAs (15 of 55) reported a diagnosis of bowel trouble, compared to 10% of treatment controls (5 of 52) and 7% of no-treatment controls (4 of 53).

Perceived Minor Medical Symptomatology

An ANCOVA tested whether the three groups differed on perceived minor physical symptomatology independent of the influence of age, education, income, and dispositional neuroticism. This analysis was not significant ($F = 3.5, ns$), suggesting that AOAs, treatment controls, and no-treatment controls experienced a similar number of physical symptoms. In an attempt to determine the source of this non-significant finding, we conducted a second ANCOVA. Because of the suggestion that neuroticism possibly inflates reports of physical symptomatology (Brett et al., 1990), the second analysis *excluded* neuroticism as a covariate. Interestingly, when the three groups were compared without controlling for neuroticism, statistically significant symptom reporting was found ($F = 10.3, p < .01$), with the pattern of results being the same as the pattern found for diagnosed health problems. The group means and SDs are shown in Table 2. On the ANCOVA that excluded neuroticism as a covariate, the two control groups did not differ significantly from one another.

Discussion

This investigation compared the physical health status of a clinical sample of AOAs who had sought psychological treatment with two types of

non-AOA control groups. Our research design allowed us to determine whether health differences existed among the groups independent of a number of "nuisance" variables that were shown to be correlated with AOA group membership status. In particular, we statistically controlled for the possibility that poor health among AOAs was confounded by the biasing effects of neuroticism-related response style as well as demographic variables such as age, education, and income. The findings support the conclusion that AOAs have a greater number of serious health problems than non-AOAs. However, they were found not to differ in terms of minor medical symptoms.

The AOA group reported a significantly greater number of physician-diagnosed health problems than either of the control groups. Moreover, this effect was not an artifact that could be attributed to factors correlated with AOA status such as dispositional neuroticism, age, education, or family income. One possible interpretation of this finding is that living in an alcoholic environment during childhood and adolescence plays a role in the development of serious physical health problems that manifest in adulthood.

However, because the AOAs who participated in this study consisted of a clinical sample who had sought professional (psychological) treatment, an alternative explanation is possible. The increased number of physician-diagnosed problems observed may reflect a differential behavioural tendency of worried-but-well AOAs to more readily seek professional help. However, this explanation seems unfeasible given that the study design included a clinical sample of non-AOA treatment-seeking controls. If seeking help from psychological professionals predicts a tendency to seek help from medical professionals, the clinical control group should not have differed from the AOA group on diagnosed health problems. This was not the case. Results for diagnosed health problems were unique to the clinical sample of AOAs. To summarize, we conclude that there is little support for the hypothesis that the poorer health of AOAs is an artifact of concurrent status as a distressed treatment-seeker. In addition, poorer health among AOAs was found to be independent of not only a neuroticism bias but also bias due to age, education, or family income. For this reason, the relatively poorer health of AOAs cannot be explained by reference to these three demographic factors, which were shown to be correlated with AOA group membership status.

However, it should be pointed out that the data for diagnosed health problems were not obtained from actual medical charts kept by a physician. Instead, they were based on participant recollections of physician diagnoses. Results based on such a proxy measure most likely include a degree of error variance unrelated to the presence of objectively verifiable organic medical pathology. Therefore, the conclusion that AOAs have

particularly poor health is tentative, requiring confirmation by additional research employing physician records.

Nevertheless, the present results are consistent with those of Roberts and Brent (1982), who found that members of alcoholic families had a greater number of physician-diagnosed health problems than controls. They are also consistent with research demonstrating increased health-care utilization rates among offspring of alcoholics (Roberts & Brent; Woodside et al., 1993) and with results suggesting that severity of medical problems is greater for offspring of alcoholics (Woodside et al.). When considered in the aggregate, the emerging pattern of findings suggests that childhood exposure to an alcoholic family environment may contribute to the development of physical health problems that manifest in adulthood. Moreover, consistent with the results of Woodside et al., our results suggest that these health problems are serious enough to receive a physician diagnosis. The present study found AOAs to have relatively higher rates of hypertension, ulcers, serious back trouble, and serious bowel trouble. The finding pertaining to bowel trouble is consistent with results reported by McGann (1990), who compared two subsamples of non-alcoholic adult medical patients attending a family practice clinic and found that patients from alcoholic and non-alcoholic families differed in terms of functional bowel syndrome. Furthermore, the findings pertaining to hypertension are consistent with research suggesting that non-alcoholic female offspring of alcoholic families exhibit an unusually high prevalence of hypertension (Miller, Finn, Ditto, & Pihl, 1989). Results of the present study help identify the nature of the particular types of medical problems that AOAs are at risk for developing. These results, however, are based on post-hoc exploratory analyses and should be considered tentative and suggestive. Nursing and allied health professionals concerned with understanding the specific health vulnerabilities of AOAs should conduct further research on this important question. The present findings are a first step in this direction.

When the three groups were compared in terms of minor medical symptomatology, analyses that adjusted for the effects of neuroticism and other potential confounds failed to support the expectation that AOAs would report more minor symptoms than non-AOAs. These null results for perceived symptoms were based on an ANCOVA in which neuroticism-stability, age, education, and income served as covariates. Moreover, as described in the Methods section, the null results were based on a measure of symptomatology that was stripped of item contamination associated with emotional distress. Results showing no differences in perceived symptomatology are inconsistent with the present results for diagnosed health problems, and also with the results of previous research (Roberts & Brent, 1982; Woodside et al., 1993). One interpretation of

these null results is that they fail to support the hypothesis that AOAs suffer from particularly poor health.

In an attempt to uncover the source of the null effect for perceived physical symptoms, we conducted an ANCOVA that *excluded* dispositional neuroticism as a covariate (but included the demographic confounds). This analysis found significant differences favouring greater physical-symptom reporting among AOAs relative to both comparison groups (see Table 2). We interpret the differing patterns of results for the two sets of ANCOVAs as indicating that neuroticism is a significant and serious statistical confound in AOA research involving self-reports of minor medical symptomatology (MMS). In other words, the divergent findings for MMS indicate that researchers who fail to control for neuroticism-related response bias may produce statistically significant — but spurious — findings linking AOA status to reports of minor physical symptoms. Thus, a major contribution of the present study is that it alerts nursing researchers to the existence of a neuroticism confound in self-report research examining health and medical problems among AOAs. Identification of this potential methodological pitfall has implications for nursing research. In particular, it highlights the importance of controlling for neuroticism bias when examining self-reports of physical symptoms in AOAs.

The question remains as to why AOAs might be at elevated risk for medical problems serious enough to be diagnosed by a physician. Because the health status of AOAs is a neglected topic, the evidence in this regard is limited and one can only speculate. More research on the mechanisms of influence is clearly warranted. Nevertheless, we offer the following speculations. One explanation for the increased risk is that AOAs may not consider health a priority and thus fail to engage in preventative health practices such as exercise or nutritious eating. A second explanation is that AOAs may engage in higher levels of health-destructive behaviours such as alcohol misuse or smoking. This speculation is consistent with previous research showing that AOAs have more drinking problems than controls (Cuijpers et al., 1999; Jacob & Windle, 2000; Jacob et al., 1999) and that drinking contributes to ill health (Arria, Tarter, & Van Thiel, 1991; Zakhari, 1991).

Another set of mechanisms has less to do with the behaviour of the AOAs themselves and more to do with the behaviour of their alcoholic parents. In particular, AOAs may have a greater number of serious medical problems during adulthood because, during their childhood and adolescence, their parents displayed high rates of nicotine dependence. Chronic exposure to high levels of second-hand cigarette smoke, therefore, might account for more health problems in AOAs relative to controls. Moreover, if the alcoholic parent was the mother, alcohol misuse

during pregnancy may have resulted in subtle types of long-lasting fetal alcohol effects that increase biological vulnerability to disease onset and progression during adulthood.

Another possible theoretical explanation for poorer health among AOAs revolves around the unique pattern of apparently discrepant results showing that significant group differences in serious health conditions coexist with no group differences in minor health symptoms. In this connection, recall that AOAs were found to have a greater number of serious health problems yet did not differ from controls in terms of indicators of minor health concerns. One possible interpretation of this incongruity is that AOAs are less subjectively aware of "minor" symptomatology. If AOAs lack awareness of subtle physical indicators of ill health, as the present results suggest, they may also display a pattern of dysfunctional illness behaviour characterized by excessive delay in seeking medical help. Delay, in turn, may result in nurses and physicians making diagnoses that are more severe. This process may account for our findings pertaining to diagnosed medical conditions as well as the findings reported by Woodside et al. (1993). One corollary of the "discrepancy model" is that non-neurotic AOAs are older than controls when they enter the health-care system. Clearly, additional research is needed to test competing models that purport to explain health outcomes related to AOA status. In this connection, establishing the validity of the proposed discrepancy model would seem to be a particularly fruitful direction for future research.

One final theoretical model merits consideration. This alternative model might be proposed by sceptics who believe there are no "real" baseline differences in objectively verifiable medical status between AOAs and controls. This sceptical model also posits the existence of differential symptom perception and illness behaviour in AOAs relative to non-AOAs. The chain of reasoning, however, is unique. Essentially, this is a "heretical" model because it posits that previous research on AOA health may have inadvertently capitalized on a type of neuroticism-related methodological bias in which high levels of negative affectivity contributed to a hypervigilance to health symptoms among AOAs, prompting them to engage in higher levels of treatment-seeking behaviour. The model posits that a tendency towards hypochondriacal behaviour in AOAs causes them to display high rates of health-care utilization — rates that do not match objective rates of biomedical illness. It further posits that differential health-care utilization rates cause AOAs to receive more physician diagnoses in the absence of a proportionately higher prevalence of objectively verifiable disease. This hypochondriacal-behaviour explanation is consistent with theory and research (Brett et al., 1990; Jorgensen & Richards, 1989) suggesting that emotional distress associated with high

levels of neuroticism can lead individuals to incorrectly label themselves as ill, which, in turn, can lead them to over-utilize medical services. Finally, because high levels of neuroticism make patients more likely to complain, nurses and doctors may be compelled to over-diagnose AOAs. To summarize, sceptics might interpret more medical diagnoses in AOAs relative to controls as reflecting the logical outcome of inflated opportunities for receiving medical diagnoses. Sceptics might propose that these inflated opportunities are the end result of two antecedent processes: the fundamental over-representation of AOAs in clinical settings, and the tendency of AOAs to be more emotive when expressing their health complaints to nurses and doctors. These two influences may combine, causing nurses and doctors to over-diagnose AOAs relative to controls.

Limitations

The present results should be interpreted with caution. A number of factors place limits on the study's internal and external validity. For example, it examined only AOAs who had sought psychological treatment. Thus, the findings may not generalize to a non-clinical (non-treatment-seeking) AOA group. Future research should examine both clinical and non-clinical samples of adult AOAs. Moreover, the present study relied solely on self-reports to assess medical health status. Given the questions about the validity of these types of self-reports, it is recommended that future studies consider assessing a diversity of "objective" and "subjective" indicators of medical well-being. In this connection, future research should also be careful to obtain measures of treatment-seeking tendencies and confounding variables such as dispositional neuroticism. Moreover, AOAs should be compared to a wider variety of control groups. Specifically, researchers could strengthen their designs by including a clinical control group from non-alcoholic but "dysfunctional" families (e.g., offspring of depressed parents). In this way, the unique effects of exposure to the alcoholic family environment can be teased apart from the more general effects of exposure to an "abnormal" family environment. Pediatric nursing researchers and other health professionals considering research in this area may wish to consult Volume 21 of *Alcohol Health and Research World* (1997), which is devoted exclusively to a discussion of concepts, findings, and methodological issues associated with research on offspring of alcoholics.

Finally, future studies will benefit from obtaining information describing variability in the length and amount of exposure to these dysfunctional home environments, and by quantifying more precisely the severity and patterning of various types of family dysfunction. In this connection, recent evidence supports the use of the Children of

Alcoholics Screening Test (CAST; Charland & Cote, 1998; Sheridan, 1995).

Summary and Nursing Implications

In spite of the limitations of the study, the results provide preliminary empirical support for the hypothesis that exposure to an alcoholic family environment during childhood and adolescence contributes to the development of serious medical problems in adulthood. Relative to non-AOA treatment-seeking controls and non-AOA non-treatment-seeking controls, treatment-seeking AOAs reported a greater number of serious physician-diagnosed health problems. This effect was independent of the biasing effects of a number of confounding variables, including dispositional neuroticism and demographic variables. When neuroticism-related response bias was statistically controlled for, AOAs did not differ from the control groups in terms of subjective perceptions of minor physical symptoms. Yet when the effects of neuroticism were not covaried, the three groups differed in a pattern identical to that for diagnosed health problems. These contrasting sets of findings suggest that future studies of AOAs that utilize self-report measures of minor health symptomatology should be careful to adjust for the potentially biasing influence of neuroticism.

We hope the results of the present study stimulate greater interest among nursing teachers, researchers, and practitioners in identifying offspring of alcoholics and understanding the negative long-term health effects of familial exposure to alcohol abuse. The results suggest that nursing training programs that include a curriculum on substance-abuse disorders should ensure that attention is given to the long-term medical effects of parental abuse. While fetal alcohol syndrome would naturally be included in such a curriculum, the scope should be broader still. In terms of screening, pediatric and other nurses should be more vigilant to the need to diagnose clients as offspring of alcoholics. The CAST (Charland & Cote, 1998; Sheridan, 1995) is available for this purpose. Once identified in the primary-care or hospital setting, these clients might further be screened for signs and symptoms of hypertension, ulcers, and serious back or bowel trouble.

More research in this neglected area of concern will contribute to improved core competencies for nurses and other health professionals with responsibility for the care of family members who live in or come from alcoholic home environments. A minimal level of competence would involve knowledge of the characteristics of these types of individuals and understanding the nature of the likely medical, emotional, and behavioural effects of long-term exposure to an alcoholic family environment. We also hope that additional research in this area will stimulate

the development of empirically determined guidelines for preventative and remedial interventions that strengthen families, maximizing opportunities for enhancing the health of at-risk offspring of alcoholics. In this connection, nursing professionals interested in prevention and intervention may wish to consult a recent review by Price and Emshoff (1997). Given the sizeable number of AOAs in Canada and the United States (Grant, 2000), it would seem prudent for public health nurses to become increasingly concerned with prevention and early identification.

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