# Job Stress Among Female Flight Attendants

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*We evaluated the presence of chronic job stressors among flight attendants (FAs) to examine the relationships between these job stressors and psychological distress and job dissatisfaction. Seventy-three female FAs (90% participation) employed at two commercial airlines completed a detailed questionnaire. Standard questions and scale measures were used to assess job stressors, psychological distress, and job dissatisfaction. The association between job stressors and these outcomes was evaluated using multiple regression analysis. Except for fatigue, distress and job dissatisfaction were moderate to low. Job stressors were found to have a substantive effect on these outcomes, following adjustment for individual factors. Despite moderate-to-low levels of distress and dissatisfaction, targeted efforts to reduce selected job stressors and to enhance social support may be important steps toward improving the well-being and satisfaction of FAs.* (J Occup Environ Med. *2003;45:703–714*)

There is a paucity of information in the scientific literature concerning flight attendants' exposure to job stressors and psychological distress outcomes. Although the flying public regularly observes flight attendants performing activities associated with routine passenger service, the critical public safety role of flight attendants and the concomitant demands often go unrecognized. These demands include unobtrusive and highly disciplined responses to medical and other emergencies, vigilance for activities within the cabin environment that may accidentally or deliberately threaten the safety of passengers or the flight crew, assurance of passenger compliance with Federal aviation regulations, and responses to passenger "air rage."

In the few published investigations of flight attendants' working conditions, more overt stressors, such as critical flight incidents and physical job stressors (noise, vibration, limited working space), are most often highlighted. For example, anxiety, flight phobias, and post-traumatic stress have been reported among air crew members (including flight attendants) after flight incidents.[1,2] Even in the absence of such incidents, up to one third (37%) of flight attendants often feel anxious before take-off.[3] Suvanto and Ilmarinen report that cognitive as well as physical job demands are a source of stress among flight attendants, noting demands for foreign language skills, the need to make decisions rapidly, and the importance of general education and professional experience in work execution.[4] A study conducted in Norway showed that only half of the flight attendants surveyed were satisfied with supervision and social

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support, and dissatisfaction was especially high concerning the sharing of information related to specific operational procedures and technical matters.[5] Findings from a recent study from Italy suggested that extended absences from home have deleterious effects on the close personal relationships of flight attendants and that flight attendants often report feelings of isolation and loneliness.[6]

Because previous studies have been limited to examinations of the psychological reaction to critical flight events or to descriptive reports of job stress conditions, this study sought to evaluate the presence of chronic job stressors among actively employed female flight attendants in the United States and to examine the relationships between these job stressors and psychological distress and job dissatisfaction. It was hypothesized that job stressors would be present, that these stressors would be associated with psychological distress and job dissatisfaction even after adjustment for individual factors, and that selected factors may mitigate the putative effects of job stressors. The specific goals of this study were: (1) to identify specific job stressors in flight attendant work for inclusion in larger reproductive epidemiology studies among this occupational group; and (2) to examine whether these job stressors predict psychological distress, perceived stress, and job dissatisfaction after adjustment for individual factors. This investigation is part of a series of studies by National Institute for Occupational Safety and Health (NIOSH; Cincinnati, OH) to characterize flight attendants' exposure to factors that may affect reproductive and other health endpoints.

Data for this study were collected before the events of September 11, 2001, or "9/11," when terrorists hijacked four commercial domestic flights, claiming the lives of all flight crew and passengers and more than 2500 people who occupied targeted buildings. The events of 9/11 underscore the real potential for flight attendants to be directly exposed to violence in the workplace. Moreover, the aftermath of 9/11 is characterized by an environment of increased threats to flight crew and passenger safety, a decline in air travel, and ensuing mass layoffs of airline personnel, airline bankruptcies, and a proposal to permit armed pilots on board commercial passenger planes. These conditions mark significant shifts in the work environment of flight attendants not addressed in this study that could have important implications for their health and welfare.

## Methods

### Study Participants

Study data were obtained from 73 female flight attendants employed at two commercial airlines in the United States. Signed informed consent was obtained from each participant. Forty-five of the flight attendants (62%) were enrolled from two airlines in a biological monitoring feasibility study of menstrual function (study A) during 1995, with data obtained by self-administered questionnaire. As described in detail by Whalen et al.,[7] participants enrolled into study A were randomly selected from employer lists that were generated according to demographic characteristics (aged 18 to 45 and female), employment characteristics (full-time flight attendant), and flight patterns maximizing the range of two factors of interest for the menstrual function study, cosmic radiation, and travel through multiple time zones. Additional selection criteria included pregnancy status (not pregnant), currently having menstrual cycles, and not using oral contraceptives or an intrauterine device. Eligible women were enrolled until the target sample size was met.

The remaining study participants ($n$ = 28, 38%) were enrolled from one of the study A airlines in a feasibility study of exposure to job stress conditions and physical work demands (study B), with data on the same battery of measures obtained by telephone interview. Participants in study B were all flight attendants selected from the employer's flight roster for one of five specific round-trip flights in 1995 or 1996 chosen according to flight duration and flight route (ie, domestic or international). Seven males who participated in study B were excluded from this analysis as a result of small numbers. Participation rates among eligible flight attendants for the two studies were 42% and 90%, respectively. The lower participation rate for study A was likely the result of substantial study demands involving the collection and storage of daily biologic samples and daily diary recordings for at least one month, as described further elsewhere.[7]

### Study Measures

The study questionnaire included over 50 measures. Nonoccupational measures included individual factors (age, race, education, height, weight, coping style), nonwork stressors (recent major life events, conflict or hostility in the home, preschool-aged children in the home), and level of social support outside of the workplace. The scale measures for coping style (active and passive) and support outside of work were selected from the NIOSH Generic Job Stress Questionnaire (NGJSQ).[8] Participants were also asked to report the number of block hours (taxi and airborne time) that they typically worked per month, whether they worked primarily on domestic or international routes and, in study B, the date they started employment as a flight attendant.

### Job Stressors

Job stressors, which were treated as independent variables in this study, were assessed primarily from responses to standard questions or multi-item scales (Appendix I). Scale measures of role ambiguity, role conflict, supervisor support, coworker support, and task control were se-

lected from the NGJSQ. Scale measures of mental demands, psychological job demands, decision latitude and job strain (ratio of psychological job demands and decision latitude) were selected from the Job Content Questionnaire.[9] A short version of the emotional load and the emotional rewards scale measures were selected from The Emotions at Work Scales by Spratt.[10] Internal reliability of the scale measures was evaluated for use in this study population using Cronbach's standardized $\alpha$ coefficient. The $\alpha$ coefficient for four scale measures (role ambiguity, role conflict, psychological job demands, emotional load) were judged to be unacceptably low ($\leq$0.61). For each of these four constructs, single-item measures from each multi-item scale were selected for use in statistical analyses based on the magnitude of the correlation of the items with the full-scale measure.

In addition to the scale measures, a single-item measure of hostility (I am exposed to conflict or hostility from the people I work with) was adapted from the 1993 Northwestern National Life Insurance Company Fear and Violence in the Workplace Survey (Minneapolis, MN; Appendix I). A composite measure of imbalance between work and nonwork obligations was developed from two items (the demands of my job create serious stress in my family and conflicts exist between job demands and outside obligations), which were adapted from Pilch.[11] A composite measure of job insecurity was developed from two items (my job security is good, reverse scored) and (during the past year, did you face job loss or layoff?), which were selected from the NGJSQ.

In addition to the standard questions and scales, information related to unusual or transient events was obtained by daily diary among participants of study A during the 1- to 3-month study period. During workdays, the daily diary obtained flight-specific schedule information, and flight attendants were asked "did anything unusual happen on today's flight(s) (flight problems, injury etc.)?" Those with an affirmative response were asked to provide an explanation. Participants of study B were asked an open-ended question, which read as follows: "Are there psychological or emotional stresses in your job that we have not asked you about that you feel may put your health or safety at risk?" Events or activities listed in the daily diary and responses to the open-ended question served to identify job stressor conditions not previously identified and to improve the context-specific interpretation of the quantitative questionnaire-based measures.

## Psychological Distress, Perceived Stress, and Job Dissatisfaction

Measures of psychological distress, perceived stress and job dissatisfaction were treated as dependent variables in this study. Multi-item adjective scales were selected from the Profile of Mood States (POMS) for the assessment of psychological distress (Appendix II). Three questions were selected for each distress scale based on factor loadings of previous studies (POMS Users Manual, 1981, Educational and Industrial Testing Service, San Diego, CA). A short version of the Perceived Stress Scale was selected to obtain a global measure of the degree to which participants appraised life situations in the recent past as stressful.[12] The internal consistency of these scale measures was evaluated for use in this study population using Cronbach's standardized $\alpha$ coefficient. A one-item measure of job satisfaction was selected from the NGJSQ.

## Data Analysis

Before combining the data from the two feasibility studies, homogeneity of the data was assessed by comparing the means of the individual factors, nonwork stressors, work-related factors (eg, block hours, flight routes), job stressors and dependent variables using *t* tests and Wilcoxon nonparametric tests and by comparing the slope of the relation between each independent and dependent variable using "study" as an interaction term. Although two independent variables (mental demands and supervisor support) and one dependent variable (fatigue) had significantly different means between the two study populations, there was no statistically significant difference in the relation (slope) between the independent and dependent variables in the two study populations. All variables were retained for subsequent analyses.

Visual inspection of the residuals was performed for all dependent variables and depression was judged to be highly skewed. After a $\log_{10}$ transformation was applied to the depression scale, the residuals were found to conform with the normality assumption of linear regression analysis.[13] Pearson correlation coefficients ($r$) were computed for the assessment of covariation among all independent and dependent variables.

Multiple linear regression analysis was used to examine the multivariate relation between job exposure factors and psychological distress, perceived stress and job dissatisfaction, adjusting for all individual factors and nonwork stressors showing at least a moderate association ($P$ value $\leq$ 0.20). Variables were retained in the final models at $P$ value $\leq$0.05. Multiple regression analyses also included an exploratory assessment of the role of factors such as coping style, social support, emotional rewards and job control in mitigating the putative effects of adverse job conditions. Due to small numbers, these models were comprised of interaction terms and lower-order components only. Interaction terms were retained at $p \leq 0.10$. Data analyses were performed using PC SAS software, version 8.1 (SAS, Cary, NC).

**TABLE 1**
Study Participant Characteristics, $n = 73$

| | Mean | SD | Range | Proportion |
|---|---|---|---|---|
| Age, years | 37.1 | 6.6 | 27–55 | |
| Body mass index (kg/m$^2$) | 21.1 | 1.6 | 18–26 | |
| Active coping | 3.5 | 1.0 | 1.5–5 | |
| Passive coping | 2.6 | 0.9 | 1–4.7 | |
| Support outside work | 10.7 | 1.6 | 6–12 | |
| Conflict at home | 1.7 | 0.8 | 1–4 | |
| Block hours worked/month | 80.1 | 14.9 | 40–115 | |
| Job seniority, years* | 13.5 | 9.3 | 2–34 | |
| Fly primarily domestic routes | | | | 49% |
| Caucasian | | | | 92% |
| College degree | | | | 34% |
| Pre-school aged child | | | | 11% |
| Recent major life change | | | | 44% |

* Data available only for participants of Study B, $n = 28$.

**TABLE 2**
Descriptive Summary of Job Stressors, $n = 73$

| | Mean | SD | Range | Proportion |
|---|---|---|---|---|
| Role ambiguity | 2.2 | 1.5 | 1–7 | |
| Role conflict | 2.9 | 1.9 | 1–7 | |
| Supervisor support | 7.5 | 1.9 | 3–11 | |
| Co-worker support | 9.5 | 1.3 | 6–12 | |
| Mental demands | 7.2 | 1.9 | 4–12 | |
| Psychological job demands | 3.1 | 0.8 | 1–5 | |
| Decision latitude | 58.6 | 10.1 | 28–84 | |
| Job strain | 0.60 | 0.17 | 0.35–1.43 | |
| Task control | 14.2 | 4.1 | 5–25 | |
| Emotional load | 4.1 | 1.2 | 1–5 | |
| Emotional rewards | 4.1 | 0.8 | 2–5 | |
| Conflict at work | 2.2 | 0.75 | 1–4 | |
| Imbalance | | | | 29% |
| Job insecurity | | | | 27% |

## Results

### Study Participants

Data on participant characteristics (individual factors, nonwork stressors, and employment) are summarized in Table 1. The average age of the study participants was 37 years, ranging from 27 to 55 years. Average body mass index (BMI) or estimate of body fat based on height and weight was 21 kg/m$^2$, and ranged from 18 to 26 (a healthy BMI for adults is between 18.5 and 24.9 kg/m$^2$, based on the effect of body weight on disease).[14] Although most participants adopted some degree of both active and passive coping strategies when faced with problems, active coping was a more prevalent coping style. Social support outside work was high, and the presence of conflict at home was moderately low (about one third of participants). Participants worked an average of 80 block hours per month and half (49%) worked primarily on domestic flight routes. The majority (92%) of the participants were Caucasian and one third had a college degree. Approximately one third (36%) had child dependents (any age) living at home and 11% had at least one preschool-aged child. Recent major life change (change in marital status, serious illness or loss of friend or family member) that was at least "somewhat stressful" was reported by 44% of the participants.

### Job Stressors

Results from the assessment of job stressors are summarized in Table 2. Role ambiguity (there are clear planned goals and objectives for my job, *reverse scored*) and role conflict (receive incompatible requests, inadequate resources, rules or policies bent to complete assignment) were fairly low. Supervisor support was moderate, whereas coworker support was high. Mental demands (intense concentration required, tasks often interrupted requiring attention at a later time, waiting for others slows me down) were moderately high. Compared with normative data for working women sampled in the US Department of Labor's Quality of Employment Surveys, mean scores for psychological job demands were significantly higher among this sample of flight attendants, whereas mean scores for decision latitude (job control) were not significantly different.[9] Emotional load (I have to seem concerned. . .) was high, as was emotional rewards (when customers say "thank you" it makes the job worthwhile, working with people is satisfying). Nearly one third (29%) of the participants reported imbalance between their job demands and obligations outside of work (including family), and imbalance was found to occur more often among those with preschool-aged children in the home (63% vs. 25%, $P = 0.03$).

### Exposure Covariation

The magnitude of the correlation between some job stressors showed evidence of exposure covariation or the joint occurrence of job stressors (Table 3). Coincident exposure was shown between mental demands and several other stressors: role conflict, low supervisor support, psychological job demands, decision latitude and conflict at work. Low supervisor support was also related to role conflict and emotional load. Imbalance

**TABLE 3**
Correlation Among Job Stressors, $n = 73$

| Job Stressors | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Role ambiguity | – | | | | | | | | | | | | | |
| 2. Role conflict | 0.06 | – | | | | | | | | | | | | |
| 3. Supervisor support | −0.08 | **−0.39**[b] | – | | | | | | | | | | | |
| 4. Co-worker support | −0.24[d] | 0.04 | 0.13 | – | | | | | | | | | | |
| 5. Mental demands | −0.21 | 0.27[d] | −0.28[d] | 0.05 | – | | | | | | | | | |
| 6. Psychological job demands | 0.05 | 0.04 | −0.02 | 0.03 | 0.28[d] | – | | | | | | | | |
| 7. Decision latitude | −0.28[d] | −0.02 | 0.23 | 0.18 | **0.30**[c] | 0.34 | – | | | | | | | |
| 8. Job strain | 0.19 | 0.01 | −0.18 | −0.03 | 0.08 | **0.36**[c] | **−0.75**[a] | – | | | | | | |
| 9. Task control | −0.16 | −0.02 | 0.13 | 0.15 | −0.04 | −0.09 | **0.49**[a] | **−0.47**[a] | – | | | | | |
| 10. Emotional load | −0.20 | −0.21 | 0.28[d] | 0.09 | −0.23 | −0.06 | 0.03 | 0.05 | −0.19 | – | | | | |
| 11. Emotional rewards | −0.12 | 0.00 | 0.21 | 0.06 | 0.01 | 0.18 | 0.26[d] | −0.08 | 0.11 | 0.01 | – | | | |
| 12. Conflict at work | −0.20 | 0.17 | 0.02 | −0.12 | **0.32**[c] | 0.27[d] | 0.27[d] | 0.17 | 0.18 | 0.14 | −0.02 | – | | |
| 13. Imbalance | 0.00 | 0.19 | −0.15 | **−0.34**[c] | 0.15 | 0.08 | −0.11 | 0.08 | −0.15 | −0.01 | −0.18 | 0.17 | – | |
| 14. Job Insecurity | −0.04 | −0.16 | −0.27[d] | −0.02 | −0.04 | −0.03 | −0.16 | 0.24[d] | −0.14 | 0.11 | 0.00 | 0.08 | −0.09 | – |

*P* value: a ≤0.0001, b ≤0.001, c ≤0.01, d ≤0.05 (bold if $P \leq 0.01$).

**TABLE 4**
Descriptive Summary of Dependent Variable Scores and Their Correlation, $n = 73$

| | | | | Correlation | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent Variables | Mean | 90th Percentile | Range | 1 | 2 | 3 | 4 | 5 | 6 |
| 1. Anger | 1.9 | 4 | 0–9 | – | | | | | |
| 2. Anxiety | 2.5 | 5 | 0–9 | **0.55**[a] | – | | | | |
| 3. Fatigue | 4.1 | 9 | 0–9 | **0.39**[b] | **0.63**[a] | – | | | |
| 4. Depression | 1.1 | 2 | 0–9 | **0.70**[a] | **0.60**[a] | **0.44**[a] | – | | |
| 5. Perceived stress | 2.7 | 6 | 0–11 | **0.52**[a] | **0.67**[a] | **0.41**[b] | **0.63**[a] | – | |
| 6. Job dissatisfaction | 1.7 | 2 | 1–3 | **0.28**[d] | 0.23 | **0.27**[d] | **0.32**[c] | 0.15 | – |

*P* value: [a] ≤ 0.0001, [b] ≤ 0.001, [c] ≤ 0.01, [d] ≤ 0.05 (bold if $p \leq 0.01$).

was inversely related to coworker support.

## Level of Psychological Distress, Perceived Stress, and Job Dissatisfaction

Except for fatigue, psychological distress levels were found to be generally low (Table 4). Fatigue was moderately high, followed by moderately low levels of anxiety and perceived stress. Depression scores were low. There were *no* reports of flight attendants being "not at all satisfied" with their job, whereas 38% reported being "very satisfied." The correlations among the distress and perceived stress variables were high.

## Bivariate Associations

Bivariate associations between the independent variables (ie, individual factors, nonwork stressors, work-related factors and job stressors) and psychological distress, perceived stress, and job dissatisfaction are summarized in Table 5. Three job stressors associated with all of the distress measures were low supervisor support, mental demands, and imbalance. However, the associations among the other independent variables were more outcome specific, such as between BMI and anxiety and between low support outside of work or job strain and depression. BMI, imbalance, and social relations variables (eg, low support outside work, low coworker support, conflict at home) were associated with perceived stress, whereas factors associated with job dissatisfaction included role ambiguity, low supervisor support, low job control, low emotional rewards, job strain, job insecurity, and the absence of preschool-aged children in the home.

## Multiple Regression Results

Final model results are shown in Table 6. The amount of variance in the distress measures explained by the models ranged from 18% for fatigue to 39% for anxiety. The proportion of the variance explained for perceived stress and job dissatisfaction was 33% and 47% respectively. After accounting for individual factors and non-work stressors, job stressors that were important predictors of psychological distress included mental demands, psychological job demands, imbalance, and low supervisor support. Model entry restrictions yielded a slightly different set of predictors for anger and fatigue. Although the model entry restrictions did not yield different results for the other outcomes, it is important to note the coincident occurrence of some job stressors in the interpretation of these multiple regression findings.

## Mediated Associations

An exploratory assessment of factors that may mediate the associations reported above provide further evidence of the important role of social relations to the occurrence of the outcomes of interest in this study.

**TABLE 5**
Bivariate Associations Between the Independent Variables and the Dependent Variables

| | Anger | Anxiety | Fatigue | Depression | Perceived Stress | Job Dissatisfaction |
|---|---|---|---|---|---|---|
| Age | 0.10 | −0.06 | −0.04 | 0.00 | 0.03 | 0.03 |
| Body mass index | 0.11 | **0.33**[c] | 0.08 | 0.17 | 0.25[d] | 0.02 |
| Education | −0.01 | 0.00 | −0.18 | 0.15 | 0.01 | 0.23 |
| Major life change | 0.07 | −0.10 | −0.15 | 0.14 | −0.02 | 0.05 |
| Pre-school child | −0.14 | 0.08 | −0.06 | −0.21 | 0.03 | −0.26[d] |
| Active coping | −0.02 | −0.14 | 0.05 | −0.05 | −0.17 | 0.03 |
| Passive coping | 0.04 | −0.09 | −0.10 | −0.09 | −0.18 | 0.01 |
| Support outside work | −0.19 | −0.16 | −0.06 | **−0.32**[c] | **−0.32**[c] | −0.16 |
| Conflict at home | 0.22 | 0.25[d] | 0.12 | 0.19[d] | **0.44**[a] | 0.08 |
| Block hours per month | −0.01 | −0.07 | −0.04 | 0.01 | −0.06 | 0.02 |
| Role ambiguity | −0.05 | 0.06 | 0.10 | 0.10 | 0.02 | 0.24[d] |
| Role conflict | 0.18 | 0.14 | 0.09 | 0.12 | 0.15 | 0.09 |
| Supervisor support | **−0.34**[c] | **−0.34**[c] | **−0.37**[b] | **−0.34**[c] | −0.20 | **−0.51**[a] |
| Co-worker support | −0.07 | −0.18 | −0.02 | −0.14 | −0.24[d] | −0.18 |
| Mental demands | **0.50**[a] | 0.27[d] | **0.36**[b] | **0.31**[c] | 0.19 | 0.14 |
| Psych. job demands | 0.21 | 0.11 | 0.22 | 0.20 | 0.22 | −0.17 |
| Decision latitude | −0.04 | −0.07 | −0.16 | −0.25[d] | −0.15 | **−0.34**[c] |
| Job strain | 0.22 | 0.17 | 0.27[d] | **0.35**[c] | 0.21 | **0.32**[c] |
| Task control | −0.18 | −0.12 | −0.21 | −0.24[d] | −0.13 | −0.28[d] |
| Emotional load | −0.01 | −0.11 | −0.21 | −0.13 | −0.15 | 0.22 |
| Emotional rewards | −0.03 | −0.14 | −0.15 | −0.06 | −0.21 | **−0.31**[c] |
| Conflict at work | 0.15 | 0.20 | 0.17 | 0.00 | 0.16 | −0.07 |
| Imbalance | **0.31**[c] | **0.51**[a] | 0.28[d] | 0.25[d] | **0.46**[a] | 0.09 |
| Job insecurity | 0.13 | 0.11 | 0.06 | 0.13 | 0.07 | **0.33**[c] |

*P* value: [a] ≤0.0001, [b] ≤0.001, [c] ≤0.01, [d] ≤0.05 (bold if *P* ≤0.01).

Higher levels of support in relations outside the workplace was found to reduce the adverse effect of imbalance on anger, whereas lower levels of support from coworkers and/or from relations outside the workplace increased the adverse effects of lower supervisor support on fatigue and job dissatisfaction. Lower levels of supervisor support increased the adverse effect of imbalance and conflict in relations at home on perceived stress, but higher task control dampened the adverse effect of lower levels of supervisor support and job dissatisfaction.

## Comparison of Domestic Versus International Flight Attendants

Half (51%) of the study participants reported that they primarily worked on international routes. The number of self-reported block hours worked per month was higher among flight attendants assigned primarily to international routes, compared with those primarily assigned to domestic routes (84 hours vs. 76 hours). International flight attendants were more likely to be non-Caucasian, were slightly older ($P = 0.13$), and slightly more likely to have a college degree ($P = 0.14$), while domestic flight attendants were slightly more likely to have a preschool-aged child in the home ($P = 0.15$). Job tenure, which was only available for participants of study B ($n = 28$), was higher for flight attendants assigned to international routes (mean = 15.3 years vs. 11.9 years, $P = 0.34$). Job strain was significantly higher among domestic flight attendants, who had higher psychological job demands ($P = 0.08$) and somewhat lower job control ($P = 0.27$), but who were also found to experience significantly higher levels of emotional rewards from their work. Fatigue was significantly higher among the domestic flight attendants ($P = 0.04$), but no other differences in outcomes were observed between domestic and international flight attendants. Because of small numbers of participants, stratified multiple regression analyses were not performed.

## Flight Attendants' Descriptions of Job Stress Conditions

Although the quantitative results described above provide important information to characterize job stress conditions, further insight into the specific manner in which selected job stressors manifest within flight attendant work is provided by flight attendants' daily diary reports of unusual flight events (study A) and from the open-ended question "are there psychological and emotional stresses in your job that we have not asked you about that you feel may put your health or safety at risk? (study B)."

Forty-two percent (19/45) of the participants from study A reported that an unusual event occurred on at least one flight during the 1- to 3-month study period. The most common events reported were flight delays and passenger-related needs

**TABLE 6**
Multiple Regression Modeling of Psychological Distress, Perceived Stress, and Job Dissatisfaction

| Model | | Semipartial $R^2$ | Standard Error | *P* Value |
|---|---|---|---|---|
| Anger ($R^2 = 0.30$)* | | | | |
| Mental demands | 0.38 | 0.25 | 0.08 | <0.01 |
| Imbalance | 0.91 | 0.05 | 0.43 | 0.04 |
| Anxiety ($R^2 = 0.39$) | | | | |
| Body mass index | 0.32 | 0.11 | 0.13 | 0.02 |
| Imbalance | 2.02 | 0.21 | 0.47 | <0.01 |
| Supervisor support | −0.31 | 0.07 | 0.11 | 0.01 |
| Fatigue ($R^2 = 0.18$)† | | | | |
| Supervisor support | −0.36 | 0.13 | 0.16 | <0.01 |
| Mental demands | 0.28 | 0.06 | 0.13 | 0.04 |
| Depression ($R^2 = 0.29$) | | | | |
| Support outside work | −0.10 | 0.11 | 0.03 | <0.01 |
| Supervisor support | −0.09 | 0.07 | 0.03 | <0.01 |
| Psychological job demands | 0.03 | 0.12 | 0.01 | 0.01 |
| Perceived stress ($R^2 = 0.33$) | | | | |
| Conflict at home | 1.05 | 0.20 | 0.31 | <0.01 |
| Imbalance | 2.09 | 0.13 | 0.56 | <0.01 |
| Job dissatisfaction ($R^2 = 0.47$) | | | | |
| Supervisor support | −0.19 | 0.26 | 0.03 | <0.01 |
| Emotional load | 0.20 | 0.12 | 0.05 | <0.01 |
| Role ambiguity | 0.13 | 0.09 | 0.04 | <0.01 |

* An alternative model for anger obtained when mental demands was restricted from entry because of its high correlation with other job stressors predicted 22% from three factors (semi-partial $R^2$): low supervisor support (0.11), imbalance (0.06), and psychological job demands (0.05).

† An alternative but equally predictive model for fatigue was obtained when mental demands was restricted from entry yielded two predictors (semi-partial $R^2$): low supervisor support (0.13) and psychological job demands (0.05).

or problems. Flight delays were often reported to result from adverse weather conditions, but delays were also reported to occur as the result of equipment problems or difficult passenger experiences (eg, intoxication). Many reports of passenger-related events occurred in conjunction with flight delays (eg, passenger deplaning, passenger anger over canceled flights, passenger anxiety about missed flight connections). Other passenger-related events included uncooperative behavior (eg, resisting seat belt use when required, sitting in a non-assigned seat, intoxication, smoking in lavatory) and abusive behavior (eg, yelling and arguing with flight attendant, and one reported incident of a flight attendant being spit on). One in-flight mechanical failure (blew a tire upon landing) and two in-flight medical incidents (passenger had a heart attack, passenger hit on the head with a briefcase) were reported. The crash of a commercial plane was reported by one flight attendant (a pilot she was flying with knew a crew member who was killed).

Flight attendants' responses to the open-ended question included concerns about the threat of terrorism, infectious diseases (colds, tuberculosis), and weather or mechanical emergencies in-flight. In addition, participants reported concern about potential long-term health consequences of exposure conditions in the cabin environment relating to air quality (eg, recirculating versus replacement air, second-hand smoke), and cabin air pressure. Flight attendants also reported the direct impacts of flight schedules and travel-related demands on biological and social rhythms. For example, flight attendants reported that east-west flights "wear you out," that sleep deficits carry over into nonwork time, and that travel logistics effectively lengthen the workday (eg, difficulties with public transportation, locating hotels). Absences associated with work travel were reported to hinder the development of nurturing relationships, and reserve status was specifically reported to complicate planning for important social events. Conditions of social isolation and detachment were also reported (eg, waking up in a "strange city," loneliness, and "sterile hotels"). Emotional load was reflected in the report of specific passenger demands and responsibilities (eg, unaccompanied minors, cultural and language differences). Crewmembers not working together during emergencies, lack of open communication with the cockpit, and performance reviews emphasizing negative aspects of performance were examples of unsupportive social relations cited by flight attendants.

## Discussion

Results of this study showed that levels of fatigue among actively employed flight attendants were moderately high, whereas anger, anxiety, depression, perceived stress and job dissatisfaction were moderately low or low. Even for the less prevalent outcomes, a considerable portion of their variance was predicted by modifiable job stressors: mental and/or psychological job demands, imbalance between job demands and outside obligations, low supervisor support, and role ambiguity and emotional load (job dissatisfaction). Several of these job stressors were found to covary, thus it may be the joint effect of these stressors that is important for the prediction of distress. The presence of social support (from all measured sources) was found to reduce the adverse effect of some job stressors while the absence of support was found to exacerbate the effect of other stressors. Although psychological distress and

job dissatisfaction levels were not excessive, the results of this study suggest that targeted efforts to facilitate balance between work and personal life, to reduce the prevalence of selected job stressors and to increase social support may be important to enhancing the well-being and satisfaction of flight attendants.

These results provide the only known empirical investigation of chronic job stressors and their association with psychological distress and job satisfaction levels among flight attendants in the United States. Associations were in the hypothesized direction and were mainly consistent with those found in other studies of job stress among women.[11,15,16] One result that was unexpected, however, was the positive relationship between higher body weight and anxiety, since 99% of the participants were at or below levels generally regarded to reflect a healthy body weight (BMI $\leq$ 25). Until the early to mid-1990s, most US airlines included body weight standards among the criteria used to judge flight attendants' fitness for duty, and periodic weigh-ins were used to demonstrate compliance (personal communication with Ms. Emily Carter, September 12, 2002, National Health Coordinator, Association of Professional Flight Attendants). This historical industry practice, combined with social expectations from the public, may have caused participants to be more self-conscious and anxious about their weight. It is also possible that social desirability caused participants to under-report their weight, although gross under-estimation seems unlikely.

Flight attendants with preschool-aged children were more likely to experience difficulty establishing balance between work demands and outside obligations and "imbalance" was found to be associated with anger, anxiety, and perceived stress. These findings are consistent with descriptive reports of job stress conditions of flight attendants in Europe[6] and in the United States,[3] including a targeted investigation of how flight attendants in the United States manage work and dependent care responsibilities.[17] Imbalance is a topic that has received increasing attention in the past decade as an important issue for the health and well-being of working women.[18–21] Imbalance may be especially great for flight attendants who can face not only irregular and long work hours, but also unpredictable schedule changes and extended absences from home or loved ones. Expanding the support already provided by some airlines for extended care childcare facilities near or at airports may greatly aid flight attendants in balancing their work and family roles and reducing levels of distress.[17,22]

Emotional load levels were found to be high, a result that was corroborated by qualitative results illuminating the sometimes critical nature of flight attendant responsibilities for passenger safety (eg, medical emergencies in-flight), passenger assistance during flight delays, and occasional uncooperative and abusive passenger behavior directed at flight attendants. In this study, emotional load as well as emotional rewards were investigated for their possible association with distress, perceived stress and level of job satisfaction. Neither variable was found to be associated with psychological distress or perceived stress, but emotional load was predictive of job dissatisfaction. At the time of this study, scales used to measure emotional labor and rewards were under development and had not yet been fully validated.[10] Reliability for the two-item emotional labor scale used in this study was low (0.52), and a single-item measure was used in place of the scale to represent this construct. Further research with an improved measure of emotional labor seems warranted to improve our understanding of the potential role of this construct on distress levels among flight attendants.

Data for this cross-sectional study were collected from a small sample ($n$ = 73) of female flight attendants employed at two commercial airlines in the United States, limiting the generalizability of our findings. The profile of job stressors in this occupational group as a whole could differ from those reported here as a result of varied employment policies and benefit structures across the airline industry. Large differences are unlikely, however, because operational procedures between airlines vary little due to regulatory mandates and because all airlines would have faced pressures to adopt similar employment policies and benefit structures to compete for flight crew employees during the period of data collection in 1995 and 1996 when unemployment was at or near historically low levels.

We should emphasize that data for this study were collected before the events of September 11, 2001 or "9/11" when the lives of all flight crew and passengers on four hijacked commercial flights were tragically lost, along with more than 2500 people who occupied targeted buildings. Immediately following these incidents, efforts to intercept possible additional hijackings led to the suspension of all civilian aviation operations for more than 2 days. Flight attendants working on 9/11 were on board flights that were aborted and diverted to alternate airports, leaving many in unfamiliar airports and cities for days and postponing their reunion with concerned loved ones. Critical flying incidents have been shown to contribute to the development of flying phobias and chronic psychiatric reactions among flight crew members.[1,2] Recent findings from a national survey on the effects of 9/11 showed that psychological distress reactions were being exhibited not only among those with direct exposure to the attacks but also among the children living in those households.[23] It is important to recognize that all aircrew personnel and their family members may be at

increased risk of adverse psychological reactions in the aftermath of 9/11.

The events of 9/11 underscore the real potential for flight attendants to be directly exposed to violence in the workplace. Although terrorism was specifically mentioned by at least one study participant as a factor that may place flight attendants health and safety at risk, the quantitative measures used in this study focused on chronic job stress conditions. Daily diary reports of unusual events during flight were obtained among more than half of the participants, providing some information on the type of acute stressor conditions that may occur more routinely in flight attendant work, such as uncooperative or abusive passenger behavior, medical emergencies or accommodations for passengers with special needs, and weather-related flight delays. Although diary reports minimize the chance for recall bias, the open ended diary design applied in this study did not permit a systematic examination of the frequency of specific unusual events. A future event diary survey, coupled with the monitoring of selected biological indices of stress, would permit a more complete understanding of the nature and pattern of flight attendants' exposure to job stressors and aid in determining the acute impact of selected events for flight attendant health and well-being.

After examining the correlations among the conceptually distinct distress measures, the individual distress measures were retained to permit us to more fully characterize the psychological distress profiles of the participants and to elucidate more specifically the impact of job stressors on the flight attendants' health and well-being. While some independent variables were common predictors of anger, anxiety, fatigue and depression, some important distinctions emerged (eg, the associations between BMI and anxiety, conflict at home and perceived stress, emotional load and job dissatisfaction). These distinctions are believed to be relevant to understanding the impact of these predictors and, consequently, are relevant to prevention.

The moderately high levels of fatigue found in this study are consistent with other studies of flight attendants.[3,24,25] This finding also corresponds with the objectively measured sleep displacement and circadian rhythm disruption measures from study A (Grajewski et al. Measuring Circadian Rhythm Disruption in Female Flight Attendants, submitted.).[26] A recent study found that job stress characteristics such as high psychological job demands and low supervisor support were associated with fatigue among women.[27] Moreover, misalignment of the sleep-wake cycle and circadian rhythms may be a chronic occupational condition that may not be readjusted fully by rest after each duty period. While associated fatigue levels may not impair job performance, feelings of fatigue and associated biological disruption may adversely affect the physical health of female flight attendants, including adverse reproductive and cardiovascular outcomes.[28–32] We are currently evaluating reproductive hormonal profiles of flight attendants in study A to investigate the association between reproductive health and circadian disruption.

Depression levels were found to be low among the flight attendants in this study. This result was corroborated by examination of data obtained on medication use in study A, which showed that only two of the forty-five (4%) flight attendants enrolled reported current use of prescription anti-depressants (information about medication use among participants of study B was not obtained). Self-selection factors may result in flight attendants having more favorable mental health than the general population, which may explain the low levels of depression and the moderate to low levels of other study outcomes. It is also possible that higher outcome levels were not found in this study because the substantial demands placed upon participants in study A may have resulted in more distressed and dissatisfied flight attendants' declining participation.

Caution in the interpretation of the multiple regression findings is warranted due to the presence of exposure covariation and due to the study's small sample size. It is important to note that several of the job stressor variables represented in the final models were correlated with other predictive job stressors. It may therefore be the joint effect of these stressors that is important for predicting the study outcomes, more than the effect of individual stressors. We therefore encourage readers to consider the collective results reported in this paper when interpreting the associations between job stressors and psychological distress, perceived stress and job dissatisfaction.

The data from two feasibility studies were combined for use in this job stress investigation to increase statistical power. Data from study A were obtained by self-administered questionnaire and the data from study B were obtained by telephone interview using the same scale measures and response options. Although the mode of administration may have influenced the response patterns of participants, a comparison of the two data sets revealed few differences in the means and no differences in the direction of the relation (slope) between the independent and dependent variables.

Because statistical power was low, we were constrained in our ability to examine differences among flight attendant groups. We were unable to examine differences in job stress profiles between flight attendants according to factors that have been reported by others to be important determinants of work load, such as cabin assignment (unpublished report), job seniority,[3] and gender.[5,33] A larger scale investigation is warranted to confirm differences in job stressors between these factors to identify flight attendants who may be at greater risk for distress.

The goal of this study was to evaluate the presence of chronic job stressors and to examine the relationships between those stressors and psychological distress, perceived stress and level of job satisfaction. Standard questions and multi-item scales were used to assess job stressors based upon flight attendants' responses. Since we sought to obtain informed and impartial assessments of job conditions, devoid of flight attendants' perceptions or appraisals, care was taken to select valid and reliable scale measures that were "low in their dependency on cognitive and emotional processing."[34] Although they are self-reported indicators themselves, flight attendants' daily diary reports of unusual events during flight provide some basis for the validity of the assessment of job stress conditions in this study.

## Conclusions

The results of this study conducted before the September 11, 2001 terrorist attacks suggest that certain chronic job stressors such as high mental and/or psychological job demands, imbalance between job demands and outside obligations, low supervisor support, and emotional load have a substantive effect on psychological distress, perceived stress and job dissatisfaction among flight attendants, following adjustment for individual factors. Despite moderate to low levels of distress and dissatisfaction, targeted efforts to reduce modifiable job stressors may significantly improve the well-being and satisfaction of flight attendants. These results can be also be used to inform the content and design of future studies of job stress among flight attendants. These studies should document the likely changing levels of psychological distress and job stress conditions to inform appropriate levels of employee assistance.

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## APPENDIX I

Job Stressor Measures.

| Job Stressors | Questionnaire Items | Cronbach's Coefficient* | Measurement Range |
|---|---|---|---|
| Role ambiguity | There are clear planned goals and objective for my job (r). | [0.39] | (1–7)[a] |
| Role conflict | I have to bend or break a rule or policy in order to carry out an assignment. | [0.61] | (1–7)[a] |
| Supervisor support | Supervisor makes work life easier; is easy to talk to; can be relied upon. | 0.85 | (3–12)[a] |
| Co-worker support | Co-workers make work life easier; are easy to talk to; can be relied upon. | 0.71 | (3–12)[a] |
| Mental demands | Long periods of intense concentration required; tasks are often interrupted requiring attention at a later time; waiting for others slows me down. | 0.64 | (3–12)[b] |
| Psychological job demands | My job requires working very fast. | [0.49] | (1–4)[b] |
| Decision latitude | Sum of two subscales: 1) skill discretion (6-items: keep learning, requires creativity and skill, has variety, can develop abilities, repetitive work (r)); 2) decision authority (3-items: make decisions, a lot of say, little freedom to decide (r)). | 0.70 | (24–96)[b] |
| Job strain | Computed from the ratio of the decision latitude and psychological job demand scales. | – | (0.25–2.0)[b] |
| Task control | Influence over amount of work; pace of work; work schedule; decisions about time sequence; ability of take a short break. | 0.71 | (5–25)[a] |
| Emotional load | At work I have to seem concerned about passengers even when I don't feel like it. | [0.52] | (1–5)[c] |
| Emotional rewards | When customers say "thank you" it makes the job worthwhile; working with people is satisfying. | 0.65 | (2–10)[c] |
| Conflict at work | I am exposed to hostility or conflict from the people I work with. | – | (1–4)[e] |
| Imbalance | Conflicts exist between job demands and outside obligations; the demands of my job create serious stress in my family. | – | (0–1)[d] |
| Job insecurity | My job security is good (r); during the past year, did you ever face job loss or layoff? | – | (0–1)[a] |

Source: a) NIOSH Generic Job Stress Questionnaire (Hurrell and McLaney, 1988), b) Job Content Questionnaire (Karasek et al., 1998), c) The Emotions at Work Scale, Version 1 (Spratt, 1994), d) composite measure adapted from Piltch (1992), e) measure adapted from the Northwestern National Life Survey on Fear and Violence in the Workplace (1993). (r) = reverse coded

* Cronbach's coefficients in brackets are for the multi-item scale version of the measure.

**APPENDIX II**

Psychological Distress, Perceived Stress, and Job Dissatisfaction Measures

| Dependent Variables | Questionnaire Items | Cronbach's Coefficient | Measurement Range |
|---|---|---|---|
| Anger | Felt resentful; felt bad-tempered; felt angry. | 0.79 | (0–9)[a] |
| Anxiety | Felt tense; felt nervous; felt on the edge. | 0.79 | (0–9)[a] |
| Fatigue | Felt bushed; felt fatigued; felt worn-out. | 0.89 | (0–9)[a] |
| Depression | Felt worthless; felt hopeless; felt sad. | 0.68 | (0–9)[a] |
| Perceived stress | Felt things were going your way (r); felt confident in your ability to handle problems (r); felt difficulties were piling up; felt you were unable to control the important things. | 0.74 | (0–12)[b] |
| Job dissatisfaction | All in all, how satisfied would you say you are with your job? (1 = very satisfied, 4 = not at all satisfied) | – | (1–4)[c] |

Source: a) Profile of Mood States (McNair DM et al., 1981); b) Perceived Stress Scale (Cohen et al., 1983); c) NIOSH Generic Job Stress Questionnaire (Hurrell and McLaney, 1988).

(r) = reverse coded.