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Flight Attendant Fatigue: A Quantitative Review of Flight Attendant Comments

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16. Abstract Today's aviation industry is a 24/7 operation that produces a variety of challenges for cabin crew members including extended duty periods, highly variable schedules, frequent time zone changes, and increased passenger loads. The present content analysis study was conducted to provide a quantitative review of flight attendant comments provided on the congressionally mandated survey of flight attendant field operations that was conducted in 2008. This report can be used as a supplement to interpret the published survey results (Avers et al., 2009b). Two hundred surveys were randomly selected for each type of operation and level of seniority. A total of 1,800 surveys with comments were content analyzed (936 paper, 864 online). Eight broad comment categories were identified, including: scheduling, health, airline and airline policy, job performance and satisfaction, meals, survey, workload, and break facilities. Each category consisted of multiple positive and negative issues identified by flight attendants. This report outlines the most frequently reported categories and issues, summarizes the key issues by type of operation (low-cost, regional, network carrier) and seniority level (junior – bottom one-third, mid – middle one-third, senior – top one-third), and provides examples of actual respondent comments for the most commonly identified topics.					
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CONTENTS

BACKGROUND	1
INTRODUCTION	1
METHOD	2
Comment Sample	2
Comment Analysis	2
Analyses	3
RESULTS	3
Overall Frequency of Occurrence	3
Scheduling	5
Health	8
Job Performance and Satisfaction	8
Airline and Airline Policy	10
Survey	10
Meals	11
Workload and Break Facilities	12
DISCUSSION	12
Limitations	12
General Findings	12
CONCLUSIONS	13
REFERENCES	13
APPENDIX A: Categories, Subcategories, and Issues	A1
APPENDIX B: Examples of Comments	B1

FLIGHT ATTENDANT FATIGUE: A QUANTITATIVE REVIEW OF FLIGHT ATTENDANT COMMENTS

BACKGROUND

While a great deal of research has been conducted on human circadian processes as applied to the scheduling and training of flight crews, relatively little research has been accomplished in cabin crew operations. Cabin crew members work in an environment that requires multiple flight legs, extended duty days, limited time off, early departures, late arrivals, and less-than-optimal sleeping conditions (Avers, Hauck, Blackwell, & Nesthus, 2009a; Caldwell, 2005; Nesthus, Schroeder, Connors, Rentmeister-Bryant, & DeRoshia, 2007). Performance of cabin duties is critical to the safety and security of the general flying public. Sleep researchers have found that all human performance is vulnerable to sleep loss and daily variations in physiological processes tied to underlying body-clock mechanisms (Caldwell, 2005). Sleep loss and the extent to which it affects fatigue and the performance of cabin crew members operating under the current duty regulations is currently unknown.

In 2005, the U.S. Congress directed the Civil Aerospace Medical Institute (CAMI) to address issues regarding flight attendant (FA) fatigue. CAMI contracted with the National Aeronautics and Space Administration (NASA) Ames Research Center's Fatigue Countermeasures Group to conduct literature and incident report reviews and examine a range of typical flight attendant schedules to assess potential vulnerability to fatigue. A published Federal Aviation Administration (FAA) Office of Aerospace Medicine Technical Report (Nestus et al., 2007) integrated two NASA reports. The report concluded that some degree of fatigue-related performance decrements were likely under the current regulations and suggested six areas of research that would facilitate understanding and government-industry decision making. The six recommendations included: 1) a survey of field operations, 2) field research on the effects of fatigue, 3) a validation of models for assessing flight attendant fatigue, 4) a focused study of incident reports, 5) a review of international policies and practices, and 6) a review of the potential benefits of training with corresponding recommendations for a training program.

In 2008, Congress provided another directive for CAMI to conduct follow-up studies in each of the six recommendation areas noted in the 2007 report. To accomplish this directive, CAMI researchers developed a

project plan for completing each recommendation. To facilitate support for these projects and ensure participation, CAMI researchers coordinated with representatives of vested organizations (e.g., Air Transport Association, Regional Airline Association, Coalition of Flight Attendants) and provided them with the opportunity to review and comment on aspects of the project plan prior to its commencement.

The current report provides a quantitative review of flight attendant comments provided on the 2008 survey of flight attendant field operations (recommendation #1). This report can be used as a supplement to interpret the published survey results (Avers et al., 2009b).

INTRODUCTION

Technological advances in the last 20 years have significantly contributed to a 24/7 aviation industry. As a result, cabin crew members are challenged continually by multiple flight legs, extended duty days, limited time off, early departures, late arrivals, less-than-optimal sleeping conditions, jet lag, and non-standard work hours such as night duty and rotating schedules (Caldwell, 2005). Despite operational requirements, the body's biological need for sleep does not change. In other words, individuals are not physiologically prepared to operate effectively on the 24/7 schedules that define today's flight operations. In 2008, the FAA was congressionally mandated to examine fatigue implications for cabin crew operations. A survey was developed as one of six projects to identify the type and frequency of fatigue experienced by flight attendants and to assess how fatigue may impact airline safety.

Overall, responses to the survey indicated that flight attendants consider fatigue to be a significant issue. According to reports from the surveyed flight attendants, most have experienced fatigue while at work and agree that it is both a common experience and a safety risk. More than half of the survey respondents reported that they had nodded off (i.e., micro-sleep) during flight during the previous bid period. Flight attendants reported average work days of 9.6 hr, with an average minimum of 6.4 hr and an average maximum of 12.9 hr. Of the top-10 contributors to fatigue, length of duty day (10 – 13 hr) was the most frequently cited factor contributing to fatigue. Duty days longer than 14 hr were identified as contributing the most to perceived fatigue.

Scheduling factors made up nine of the 10 most common recommendations for operational change that flight attendants had selected from a list identified to reduce flight attendant fatigue. The most commonly selected recommendations were: eliminate reduced rest, do not mix continuous duty overnight with early-morning report times, maintain consistent scheduling, limit number of flight segments/legs, limit number of duty hours allowed, start scheduled rest period on arrival at hotel, lengthen rest periods, do not schedule several-hour breaks or “airport sits” between flight segments/legs, schedule enough time between flight segments/legs for meals, and provide flight attendants with food and beverages on flights.

The survey provided flight attendants the opportunity to submit comments and further expound on their personal challenges, concerns, and recommendations associated with fatigue. Due to the large number of comments submitted, a random sample of comments was content-analyzed and quantified. This report outlines the most frequently reported issues, summarizes the key issues by type of operation (low-cost, regional, network carrier) and seniority level (junior – bottom one-third, mid – middle one-third, senior – top one-third), and provides examples of actual respondent comments for the most commonly identified issues. An examination of the comments provided a prioritization of flight attendant issues in a free-form context and illustrated the intricacies associated with fatigue and current cabin crew operations.

METHOD

The flight attendant fatigue survey was administered both electronically and in hard-copy form to 20,826 FAs. Although 10,550 were completed and returned or submitted online, only 9,180 met the criteria for inclusion in analyses (i.e., an active FA working for his/her current airline at least one month and had flown within the previous bid period). Approximately 37% of the

surveys included in the analyses contained comments: 1,933 paper and 1,506 online.

Comment Sample

Comments were only included in this study if they were provided on a completed, eligible survey. To ensure the sample of comments was representative of the overall general survey respondents, two demographic items classified eligible surveys: 1) type of operation (low-cost, regional, network), and 2) flight attendant seniority level (junior, mid, senior). This resulted in nine different potential survey classifications (see Table 1). Two hundred surveys were randomly selected for each of the specified survey classifications and selections were balanced by method of survey completion: 52% paper, 48% online. A total of 1,800 surveys were then content-coded (936 paper, 864 online).

Comment Analysis

Category identification. Few would disagree that operational conditions and individual differences influence fatigue. The flight attendant fatigue survey was designed to assess each of these relevant contributors (Avers et al., 2009b). A hybrid approach using the survey infrastructure and a review of actual comments produced the key comment categories for the current report. Using this approach, eight broad categories were identified, including: scheduling, health, airline and airline policy, job performance and satisfaction, meals, survey, workload, and break facilities. Several of the larger categories encompassed a broad variety of topics or issues. For example, the scheduling category consists of issues such as duty day, rest periods, and reserves. Those issues were organized into subcategories within the larger category of scheduling. Each category consisted of multiple positive and negative issues identified by flight attendants. Seventy-eight issues were identified in total (56 negative, 22 positive). See Appendix A for a complete

Table 1. *Comment Breakout by Airline Type and Seniority Level*

		Airline Type			
		Low-cost	Regional	Network Carrier	
Paper Comments	Seniority				936 Surveys
	Junior	104	104	104	
	Mid	104	104	104	
	Senior	104	104	104	
Online Comments	Seniority				864 Surveys
	Junior	96	96	96	
	Mid	96	96	96	
	Senior	96	96	96	

"I would just like to say I really enjoy my job^{100P}. One of my main concerns is that sometimes due to such extremely long, hard days⁴ without a sufficient amount of sleep⁶⁴ and trying to survive on unnutritional [sic] food⁷⁴, I sometimes wonder and am greatly concerned of mine and my crew's ability to react during an emergency⁹⁰. Many, many times we are exhausted⁸²."

This comment was assigned six codes. The first sentence was coded 100P representing a positive (P) statement about the respondent's job satisfaction: "I would just like to say I really enjoy my job." The second underlined section was a negative reference to the length of duty day (4): "extremely long, hard days." The third code assigned was 64 for a negative comment about the amount of sleep received. The next statement was assigned a 74 regarding the poor nutritional value of available food. The fifth section, "greatly concerned of mine and my crew's ability to react during an emergency" was coded a 90 for the negative impact of fatigue on safety or job performance and the final portion of the comment was assigned the code 82 representing fatigue or exhaustion.

Figure 1. Example of comment coding procedure.

list of comment categories and subcategories, as well as all corresponding issues.

Comment evaluation. Once the comment categories and corresponding issues were identified, a subset of commented surveys was used to train four judges. The four judges were required to complete a 40-hr training program involving instruction, practice, and feedback. During this training, the judges were familiarized with the FA comments, corresponding comment categories and issues, and example indicators for each category or issue classification. Once the trained judges were familiarized with the comment categories and issues, they were asked to identify which categories and issues were present in a commented survey. Specifically, each of the four judges was provided ten identical sets of respondent comments. Judges independently read comments, underlined sections of comments that could be categorized, and wrote the category or issue code above the underlined section (See Figure 1 for example). Codes were entered into a database for each judge. Common codes were accepted and differing codes were resolved through group discussion. No code was accepted until 100% interrater agreement was obtained.

Overall, a total of 8,760 codes or issues were identified in the comments provided by the 1,800 flight attendants included in this sample. The final number of unique codes assigned to each survey ranged from 1 to 20 (mean = 4.8; med = 4.0; SD = 3.2). Each code was applied only once per survey to avoid inflating the value of comments from any given flight attendant. Of the 8,760 codes overall, 8,035 (92%) were negative and 725 (8%) were positive – a finding that is not surprising since people tend to focus on negative information more than positive (Baumiester, Bratslavsky, Finkenauer, & Vohs, 2001; Pratto & John, 1991).

Analyses

This report outlines the most frequently reported category and corresponding issues and examines potential differences amongst the FA groups of this study (type of operation (3) X seniority level (3)). To address the questions presented in our study, a series of analyses was conducted. First, descriptive statistics were applied to evaluate the relative occurrence rate of each broad category and the corresponding issues. Second, chi-square analyses were run to identify significant group differences for the most highly prioritized issues.

RESULTS

Overall Frequency of Occurrence

Given the limited qualitative information available regarding flight attendant concerns or issues relating to fatigue, one of the primary objectives of this study was to identify the issues and their relative frequency. A frequency analysis of the eight broad categories indicated more than one-third of the flight attendants in the coded sample commented on scheduling (n = 1,418, 79%), health (n = 1,104, 61%), job performance and satisfaction (n = 643, 36%), and airline and airline policy (n = 587, 33%). See Table 2 for the frequencies of each category across airline type.

We also examined the top 15 most frequently reported issues across the eight broad categories (issues identified by at least 10% of the comment sample in this study (n = 180)). Chi-square analysis was used to determine whether the issues were globalized across flight attendants or specific to a particular group of flight attendants (type of operation, seniority level, or type of operation X seniority level). See Table 3 for the most frequently reported issues.

Across these categories, the top three most frequently identified issues by FAs were within the health category: "fatigue/exhaustion" (n = 803, 45%); and the scheduling

Table 2. Frequency of Category Comments by Seniority Level Within Airline Type

Category	Low-cost			Regional			Network			Overall
	Junior	Mid	Senior	Junior	Mid	Senior	Junior	Mid	Senior	
Scheduling	168	155	162	162	151	165	152	157	146	1418
Health	120	124	123	126	115	119	120	131	126	1104
Job Performance and Satisfaction	80	65	70	79	65	67	78	69	70	643
Airline and Airline Policy	57	68	85	63	73	74	55	72	69	616
Survey	41	46	38	36	40	49	54	53	53	410
Meals	29	40	45	51	47	43	46	42	36	379
Workload	26	34	38	33	26	31	23	39	38	288
Break Facilities	20	23	29	25	20	27	15	42	37	238

Table 3. Frequency of Issue by Seniority Level Within Airline Type

Frequency Rank	Issue	Low-cost			Regional			Network			Overall
		Junior	Mid	Senior	Junior	Mid	Senior	Junior	Mid	Senior	
1	Fatigued/Exhausted	84	87	85	92	86	93	84	98	94	803
2	Rest period too short	73	76	89	63	90	82	84	94	76	727
3	Duty day too long	53	72	75	56	56	75	55	75	50	567
4	Inadequate amount of sleep/rest	53	45	47	50	40	45	48	60	51	439
5	Fatigue impact on safety/job performance	46	34	38	30	42	46	45	42	36	359
6	Transportation to/from rest accommodations should not be included in rest period	35	41	33	29	50	49	28	34	25	324
7	Appreciation of fatigue research/survey	30	38	26	28	32	36	39	40	36	305
8	Long periods without food/No time to eat/No food or water available	25	36	36	43	36	33	28	25	14	276
9	Dissatisfaction with airline/Airline concern for FA health and welfare	28	24	36	25	34	37	26	25	25	260
10	Physical health suffers due to job	24	22	21	24	17	23	27	39	36	233
11	Dissatisfaction with pay/Pay for time worked	30	21	24	32	17	17	30	29	32	232
12	Insufficient number of breaks/Amount of time for breaks	18	22	29	22	24	28	17	31	26	217
13	Inconsistent or early reports (mixed early/late)	19	18	26	22	29	25	26	29	19	213
14	Too many legs/Segments/ Swaps	23	22	15	37	26	32	22	17	8	202
15	Impact of delays not considered	17	25	33	19	24	30	20	20	14	202

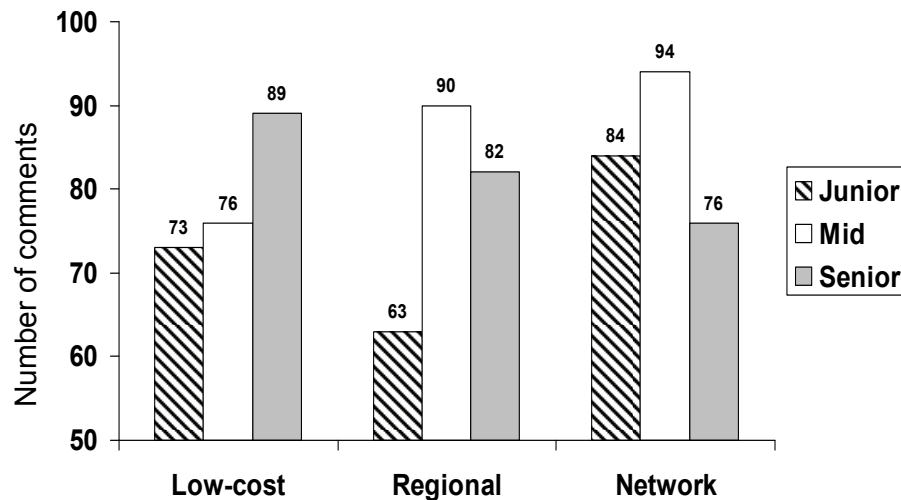


Figure 2. Number of comments for “Rest Period too Short” by seniority level across type of operation.

category: “rest period too short” ($n = 727$, 40%) and “duty day too long” ($n = 567$, 32%). The least frequently identified issues were “adequate amount of sleep” ($n = 1$, 0.1%), “satisfaction with benefits” ($n = 1$, 0.1%), and “good quality of food available” ($n = 1$, 0.1%). Although the range in frequency is quite diverse, the findings do appear to be consistent with other reports (Avers et al., 2009b; Enck, Muller-Sacks, Holtmann, & Wegmann, 1995; Ewing, 1999; Haugli, Skogstad, & Hellesoy, 1994; Hunt & Space, 1994; Nagda & Koontz, 2003; Nesthus et al., 2007; Rayman, 1997; Smolensky, Lee, Mott, & Colligan, 1982; Tashkin, Coulson, Simmons, & Spivey, 1983).

Scheduling

Table 2 shows the most commonly cited category was scheduling. The category consisted of five subcategories and 26 issues. Within the scheduling category, the most commonly cited issues were “rest period too short” ($n = 727$, 40%), “duty day too long” ($n = 567$, 32%), and “transportation to/from rest accommodations should not be included in rest period” ($n = 324$, 18%). Interestingly, each of these issues was inherently tied to current rest and duty time restrictions. A chi-square analysis across type of operation and seniority level identified issues within the scheduling category that were consistently important and some that were differentially important. Three issues showed no difference across type of operation and seniority level: “rest period too short” ($\chi^2 = 1.444$, $p > .05$; $\chi^2 = 5.764$, $p > .05$; see Figure 2), “inconsistent or early reports” ($\chi^2 = 1.566$, $p > .05$; $\chi^2 = .671$, $p > .05$; see Figure 3), and “impact of delays not considered” ($\chi^2 = 4.494$, $p > .05$; $\chi^2 = 3.758$, $p > .05$; see Figure 4). In other words, these three issues were identified consistently as important to FAs across type of operation and seniority level. In contrast, some issues were differentially impor-

tant. “Duty day too long” was reported less frequently by junior-level FAs ($\chi^2 = 7.276$, $p < .05$) across type of operation ($\chi^2 = 1.591$, $p > .05$; see Figure 5). Main effects for “transportation to/from rest accommodations should not be included in rest period” were found for both type of operation ($\chi^2 = 9.51$, $p < .01$) and seniority level ($\chi^2 = 6.17$, $p < .05$). Regional FAs identified this issue most frequently, while network FAs had the fewest comments about this issue. Overall, junior-level FAs had the fewest comments, and mid-level FAs had the most comments recommending that “transportation to/from rest accommodations should not be included in the rest period” (see Figure 6). A substantial number of flight attendants reported “insufficient number of breaks/amount of time for breaks,” but senior-level FAs identified this issue more frequently than junior-level FAs ($\chi^2 = 5.83$, $p < .05$; see Figure 7). There was no difference by type of operation ($\chi^2 = .262$, $p > .05$). Not surprising, the regional FAs identified “too many legs/segments” more frequently than either low-cost or network FAs ($\chi^2 = 20.62$, $p < .01$). Moreover, junior-level FAs identified this issue more than senior-level FAs ($\chi^2 = 6.23$, $p < .05$; see Figure 8). This may be a result of current bid practices. More senior FAs have greater opportunities and the ability to select their ideal schedules – typically longer flights with fewer segments.

In these comments, FAs discussed excessive length of the duty day and indicated that the minimum rest period should be lengthened. Some suggested the rest period should be 12 or 14 hr, while others proposed that rest periods should equal or exceed the length of the previous and/or following duty day. For example, one flight attendant said, “Layover rest periods or scheduled rest periods should never be shorter than the longest duty day.” Flight attendants reported that the activities required during the designated rest periods significantly

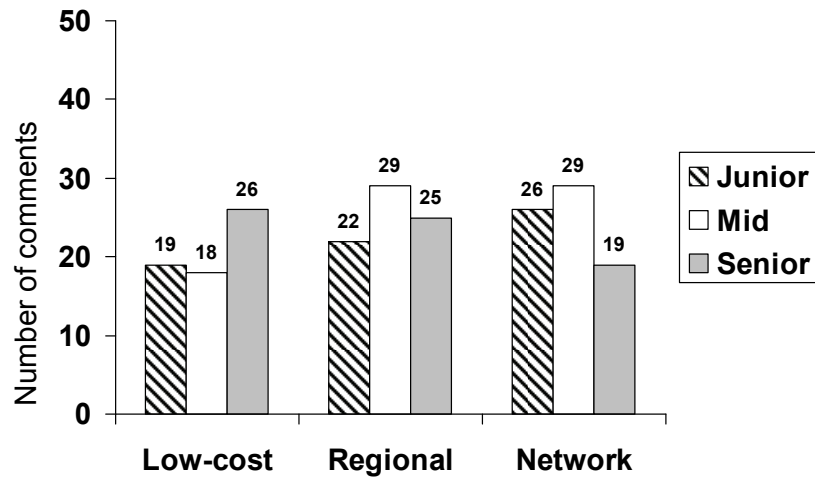


Figure 3. Number of comments for “Inconsistent or Early Reports” by seniority level across type of operation.

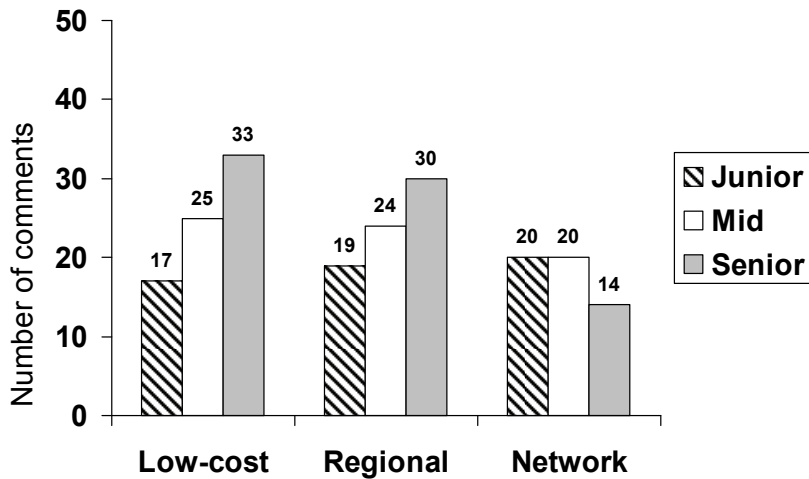


Figure 4. Number of comments for “Impact of Delays not Considered” by seniority level across type of operation.

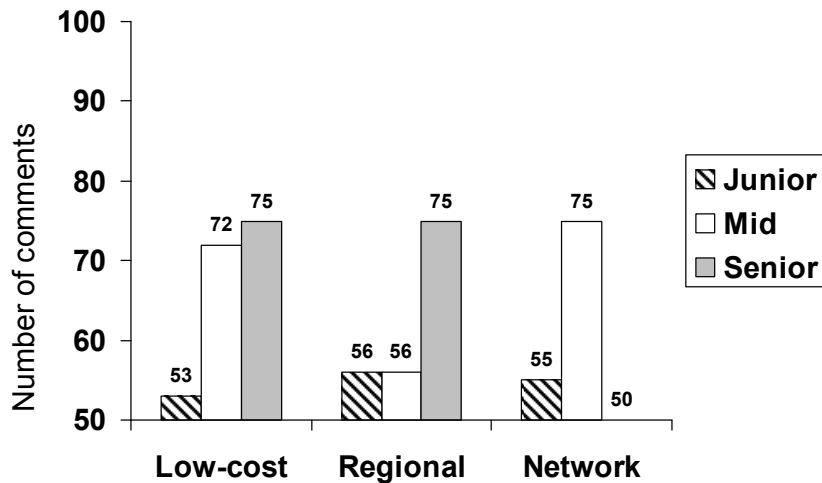


Figure 5. Number of comments for “Duty Day too Long” by seniority level across type of operation.

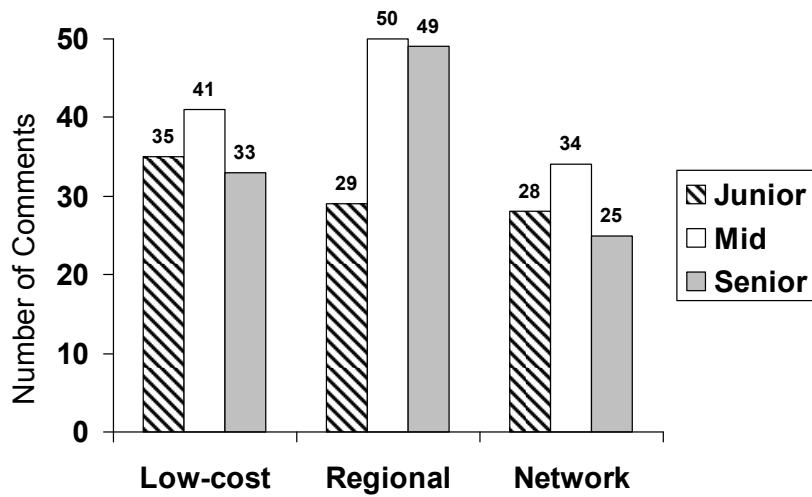


Figure 6. Number of comments for “Transportation to/from Rest Accommodations should not be Included in the Rest Period” by seniority level across type of operation.

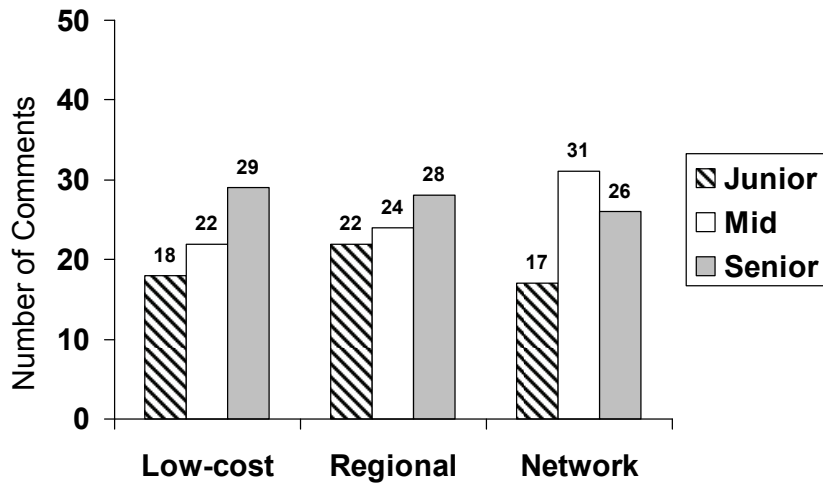


Figure 7. Number of comments for “Insufficient Number of Breaks/Amount of Time for Breaks” by seniority level across type of operation.

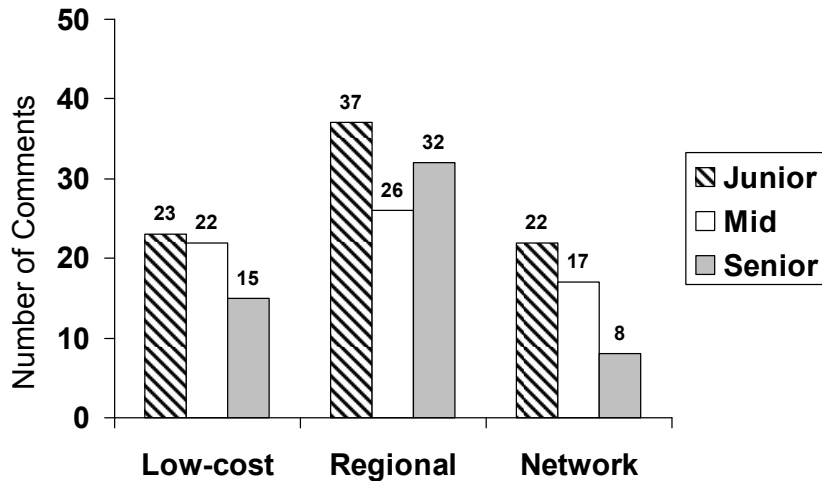


Figure 8. Number of comments for “Too many legs/segments” by seniority level across type of operation.

reduced the amount of time available for actual rest or sleep. Activities mentioned included deplaning passengers, transportation to/from accommodations, acquiring a room, finding food/eating, decompressing or getting ready for sleep, showering, dressing, and reporting early for the next flight. One flight attendant offered the following comment:

Currently at [Airline], there are many actions that occur after the aircraft door is opened at the end of a duty period. This includes deplaning all passengers as well as seeing to special assist pax's, cleaning the aircraft (sometimes), getting out of the airport (can take up to 30 minutes in larger airports!), waiting on hotel transportation (never dependable), checking in to hotel and making sure room is ready (A/C working, not already occupied, etc.). This "rest" also excludes travel time from hotel, which is becoming earlier and earlier due to increased traffic conditions everywhere.

Overall, FAs expressed the desire for rest periods to start upon arrival at hotel accommodations or 'Behind the Door.' See Appendix B for a more comprehensive list of example comments.

Some scheduling issues are independent of current regulatory restrictions and may vary by company policy or scheduling practices. Currently there are no regulations regarding the number of segments a flight attendant can fly in a day, the number or length of breaks, and scheduling of inconsistent or early reporting times.

Health

The second most commonly cited category was health. This category contained six issues. Within health, the most commonly cited issues were "fatigued/exhausted" (n = 803, 45%), "inadequate amount of sleep/rest" (n = 439, 24%), and "physical health suffers due to job" (n = 233, 13%). A chi-square analysis across type of

operation and seniority level for these issues indicated no significant differences for "fatigued/exhausted" ($\chi^2 = 1.46, p > .05$; $\chi^2 = .60, p > .05$; see Figure 9) or "inadequate amount of sleep/rest" ($\chi^2 = 2.63, p > .05$; $\chi^2 = .31, p > .05$; see Figure 10). In other words, flight attendants across type of operation and seniority level were concerned with fatigue/exhaustion and the lack of sleep/rest they are routinely able to get. On the other hand, a significant difference between type of operation was detected for "physical health suffers due to job" ($\chi^2 = 13.20, p < .01$; see Figure 11), such that network flight attendants as a group had more comments regarding their physical health suffering than either low-cost or regional flight attendants.

Some flight attendants made comments about the prevalence of fatigue in the airline industry (e.g., "Flight attendant fatigue is a serious and constant problem within the industry."), while others indicated that they personally suffered from fatigue or exhaustion (e.g., "I feel it is aging me and taking a bigger toll on my health than any other job I have worked. I would not recommend this job to anyone who has their physical health as a priority."). Comments associated with "inadequate amount of sleep/rest" were most frequently associated with reduced sleep due to short layovers and early-morning report times, trouble falling asleep when fatigued or in a different time zone, circadian rhythm or body clock disruption, and reported use of sleep aids.

Job Performance and Satisfaction

The next most commonly cited category involved issues of job performance and satisfaction. This category contained three subcategories and eight issues. The most commonly cited issues regarding job performance and satisfaction were "fatigue impact on safety/job performance" (n = 359, 20%) and "dissatisfaction with pay/pay for time worked" (n = 232, 13%). Chi-square analyses revealed

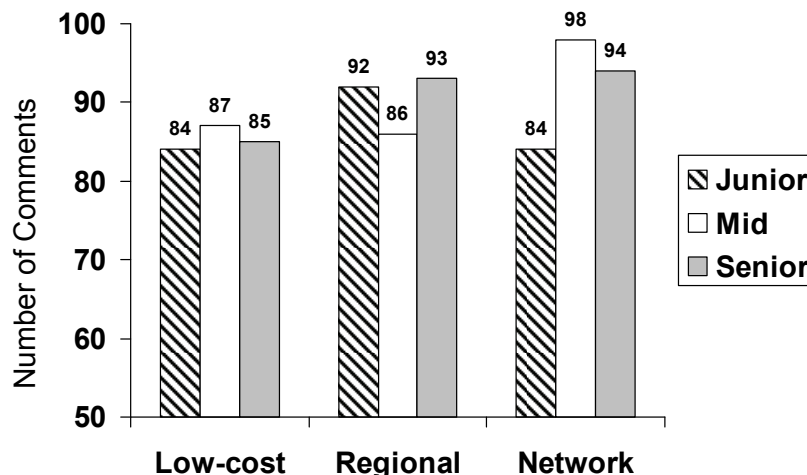


Figure 9. Number of comments for "Fatigued/Exhausted" by seniority level across type of operation.

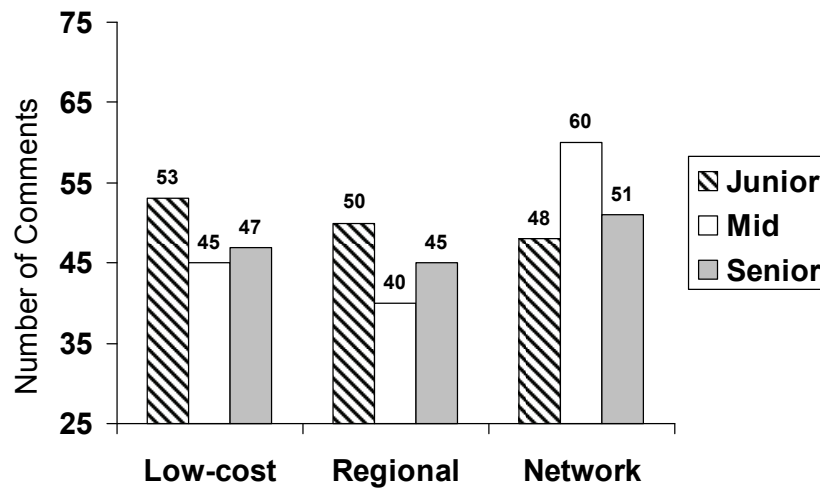


Figure 10. Number of comments for “Inadequate Amount of Sleep/Rest” by seniority level across type of operation.

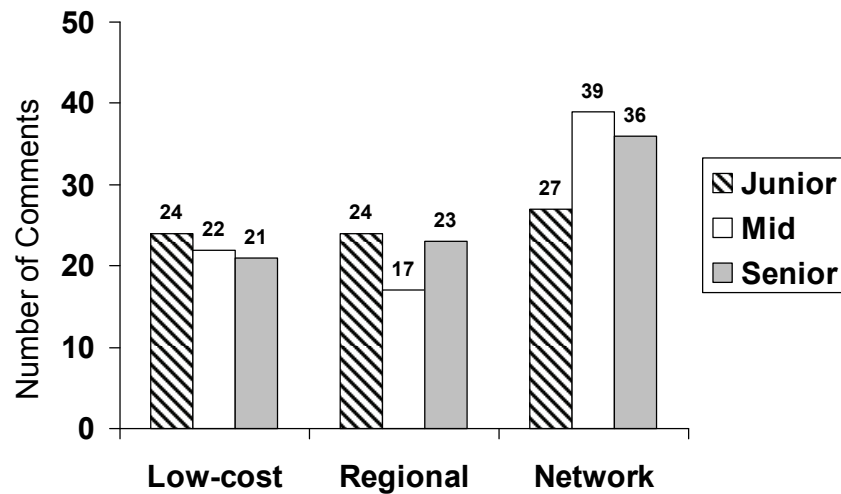


Figure 11. Number of comments for “Physical Health Suffers due to Job” by seniority level across type of operation.

that there were no significant differences for either of these comments across type of operation or seniority level ($\chi^2 = 0.17, p > .05$, and $\chi^2 = 4.76, p > .05$, respectively). These results suggested that the impact of fatigue on job performance or safety and dissatisfaction with pay/pay for time worked were a concern for FAs across type of operation and seniority level (see Figures 12 and 13, respectively). Many flight attendants expressed concern regarding their ability to do their job safely under current operational schedules. Some discussed their inability to focus and remember routine tasks, the compromised quality of their performance, and even their fears regarding their ability to respond appropriately in an emergency.

Although at face value, flight attendant dissatisfaction with pay/pay for time worked appears to be a completely separate issue, a closer inspection indicated that it may

be tied to the overarching fatigue issues. Some FAs referenced the amount of pay received; however, the majority of comments within this topic referenced the job requirements that are not considered duty time and are, therefore, unpaid. For example, many FAs indicated that they are required to report 20 to 30 min prior to departure time but are not paid until the door closes or until ‘block out’ when the airplane pulls away from the gate. For instance, one flight attendant commented “boarding the A/C [aircraft] is the most stressful time of any pairing; to be working for no pay during this time period is ludicrous, antiquated, and unacceptable, especially when a typical duty day can include up to 5 boardings.” FAs reported that their pay stops at “block in” when the door opens. However, many duties are required during the time from report until the FA leaves the aircraft and

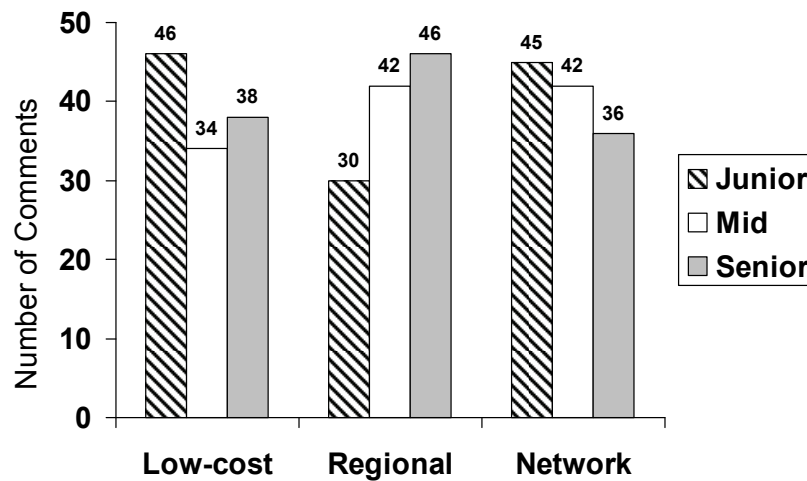


Figure 12. Number of comments for “Fatigue Impact on Safety/Job Performance” by seniority level across type of operation.

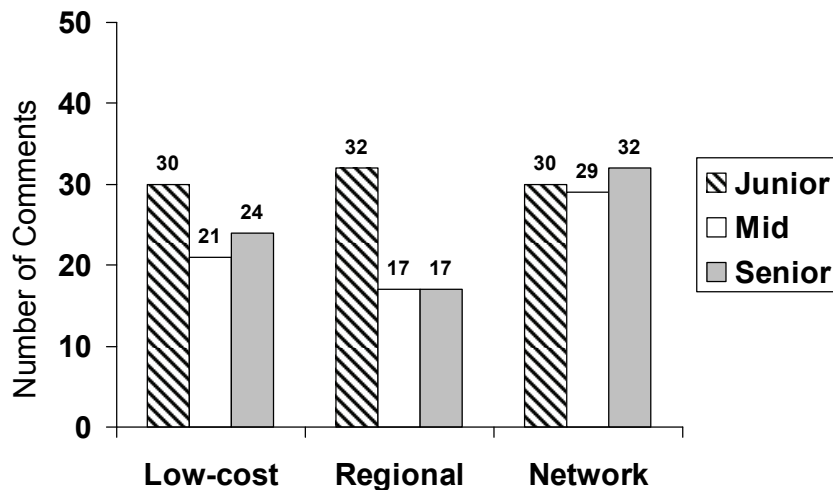


Figure 13. Number of comments for “Dissatisfaction with Pay/Pay for Time Worked” by seniority level across type of operation.

the performance of these duties are ‘off the clock’. Some examples of “off the clock” duties include stocking the galley, boarding or deplaning passengers, stowing luggage, and security sweeps. In addition to duties performed, many FAs felt that long “sits” at airports between flights should be paid given that the FA does not have the ability to leave the airport and the “sits” caused long duty days and increased fatigue.

Airline and Airline Policy

The fourth most commonly cited category concerned airline and airline policy. This category consisted of three subcategories and 13 issues. The most commonly cited issue with regard to airline and airline policy was “dissatisfaction with airline/airline concern for flight attendant health and welfare” (n = 260, 14%). A chi-square analysis found no significant differences across type of operation

or seniority level ($\chi^2 = 2.73, p > .05$; $\chi^2 = 2.71, p > .05$; see Figure 14), suggesting that dissatisfaction with the airline or the airline’s concern for FA health and welfare was an issue across all groups.

Many FAs suggested that their airlines were not concerned for employee health or safety but rather were concerned about money. For example, one flight attendant commented, “In the last few years with the economy we’ve taken 40% pay cuts and lost ground in staffing and work rules. We need a federal mandate to help us because all airline managements push as far as possible to help with the bottom line profits.”

Survey

The next most commonly cited category was with regards to the actual survey. This category was comprised of four issues. The most commonly cited issue with regard to the

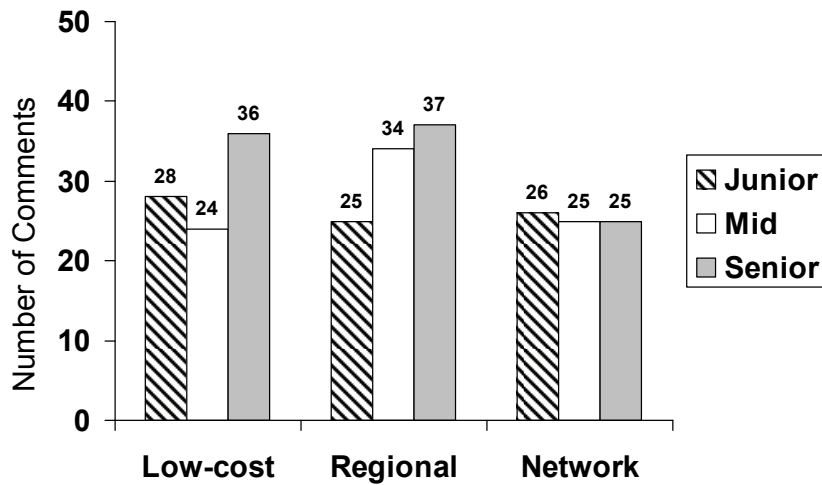


Figure 14. Number of comments for “Dissatisfaction with Airline/Airline Concern for Flight Attendant Health and Welfare” by seniority level across type of operation.

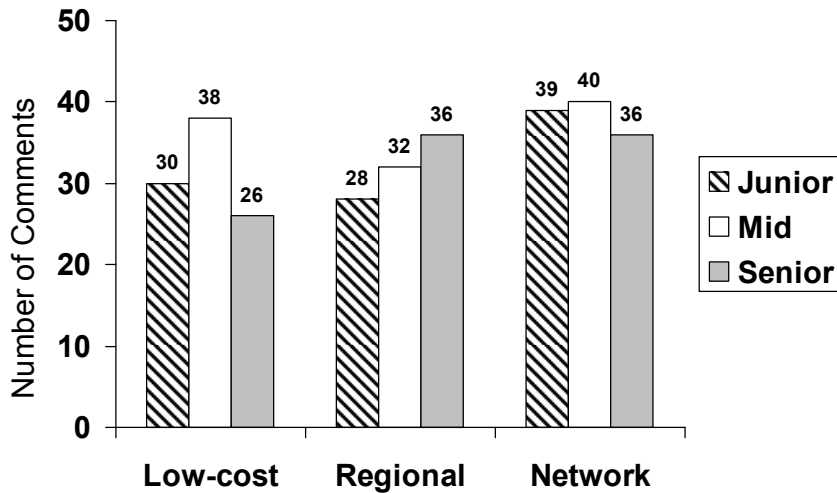


Figure 15. Number of comments for “Appreciation of Fatigue Research/Survey” by seniority level across type of operation.

survey they were completing was also the only positive issue to make the top fifteen, “appreciation of fatigue research/survey” (n = 305, 17%). A chi-square analysis revealed no significant differences across type of operation or seniority level ($\chi^2 = 3.18, p > .05$; $\chi^2 = 1.24, p > .05$; see Figure 15). This suggests that across these groups, flight attendants were generally appreciative of the fatigue research that was being conducted. For instance, one flight attendant commented, “Thank you for conducting this survey as Flight Attendant health is a growing concern.” That said, it should be noted that some were not appreciative of the survey – albeit very few (n = 7, 0.4%).

Meals

The sixth most commonly cited category concerned meals. This category consisted of six issues. The most common of these issues was “long periods of time without food/

no time to eat/no food or water available” (n = 276, 15%). A chi-square analysis revealed a significant difference across type of operation ($\chi^2 = 13.48, p < .01$; see Figure 16). This issue was listed most frequently by regional FAs followed by low-cost. Network carrier FAs made considerably fewer negative statements about long periods without food. This includes only references to the ability to find food or water and the time to eat. Most comments referred to obtaining or eating while on duty; however, some FAs indicated that finding food while on layover can be problematic due to the time of arrival and/or departure and/or the location of rest accommodations. One flight attendant commented, “No time between flights to eat, not enough water provided in flight to stay hydrated, and short layovers resulting in lost sleep.”

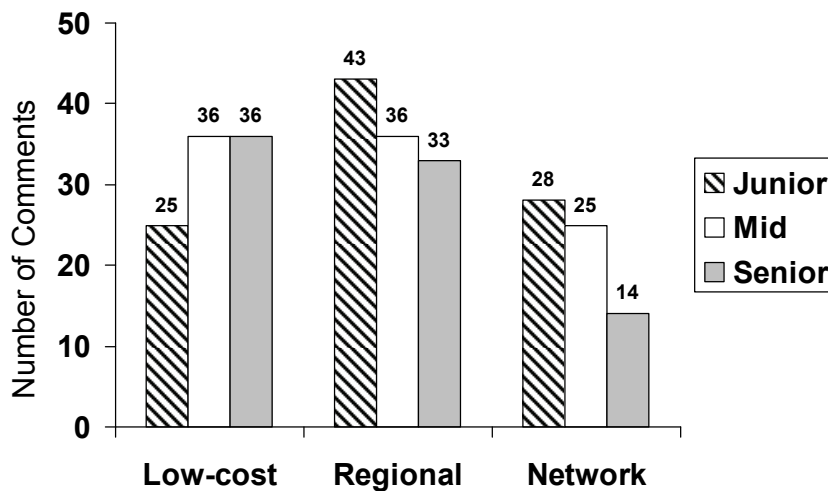


Figure 16. Number of comments for “Long Periods of Time without Food/No Time to Eat/No Food or Water Available” by seniority level across type of operation.

Workload and Break Facilities

The seventh and eighth categories evidenced in the comments discussed workload and break facilities. None of the issues that were reported in these categories reached the 10% responding threshold for further analysis.

DISCUSSION

Limitations

Before turning to the broader implications of the present report, certain methodological limitations and conceptual issues should be noted. Qualitative studies, in particular, are methodologically limited by the subjective evaluations of researchers or coders. Code determinations depend on researcher and coder perceptions and understanding of the comments. To minimize the affect of researcher or coder bias, a stringent methodology was applied for category development and coding: 1) the comment categories were largely aligned with the infrastructure of the survey, 2) multiple coders reviewed each comment, and 3) no comment code was accepted unless 100% interrater agreement was achieved. In addition to the methodological limitations associated with content analysis, the present study should primarily be used as a supplemental examination of fatigue-related issues. In other words, this report does not provide objective fatigue data, but rather provides context and interpretive guidance for more objective collections and reports on FA fatigue (e.g., Roma, Mallis, & Hursh, 2010; Roma, Mallis, Hursh, Mead, & Nesthus, 2010).

General Findings

Despite the noted limitations, we believe that the results obtained in the present study have some noteworthy implications for understanding fatigue in cabin crew operations. Overall, flight attendants considered fatigue to be a significant issue, and in fact, fatigue was the most frequently identified issue in the comments. The prioritization of issues provided by FAs is important for understanding the urgency with which they view fatigue. Even more important is in knowing that this is an issue that spans the various types of operations and seniority levels – it is not limited to one subset of the population. The top five reported comments all related specifically to concerns regarding fatigue, fatigue contributors, and fatigue safety risks. All flight attendants, regardless of type of operation or seniority level, reported concerns associated with being fatigued/exhausted, having rest periods that are too short, inconsistent scheduling or early reports, not considering the impact of delays when scheduling, not receiving adequate sleep/rest, and the impact of fatigue on safety/performance. Given that these issues were also identified consistently in open-response items, it is not surprising given that a substantial number of FAs also reported their appreciation of the congressionally mandated fatigue research.

Separate from issues that may be linked directly to fatigue, FAs agreed on two additional points. In particular, flight attendants across type of operation and seniority level were dissatisfied with their airline and the concern the airline demonstrated for their health and welfare as well as the airlines current compensation systems.

Flight attendant fatigue and many of its contributing factors were identified consistently, but there were some variations by type of operation and seniority level.

Type of operations. An examination of the results indicated that flight attendants from regional operations identified three issues more frequently than the other operations. Specifically, FAs from regional operations expressed significantly more concerns regarding “too many legs/segments,” “long periods of time without food/no time to eat/no food or water available,” and “transportation to/from rest accommodations should not be included in rest period.” The general trend revealed prevalence amongst regionals, followed by low-cost, and then network operations. Apparently, operational constraints associated with regional airlines introduced some potential fatigue issues that need to be examined. With that in mind, it should be recognized that the network flight attendants did report “physical health suffers due to job” most frequently.

Seniority level. Interestingly, the results regarding seniority level were a little more varied. Junior-level FAs identified “too many legs/segments” as an issue more frequently than senior-level FAs. While in contrast, senior-level FAs reported “insufficient number of breaks/amount of time for breaks” more frequently. These may actually be inherently related issues that were reported simply in different terms by junior- and senior-level flight attendants. Regardless, both of these issues appear to be of concern. The issues regarding duty day length and recommendations regarding transportation to/from rest accommodations and its inclusion in the duty day were reported less frequently by junior-level FAs across type of operation and most frequently by mid-level FAs. These results seem to indicate that there are differential issues by seniority level. This variance may be attributed to a number of factors that could be examined separately.

CONCLUSIONS

Results of our national survey of flight attendant fatigue (Avers et al., 2009b) found that long duty days, consecutive duty days, length of layovers, long delays, breaks, and nutrition were issues of concern. The results of the present analysis of FA comments corroborate and emphasize the same issues. Of the fatigue factors reportedly having the most pronounced effect on fatigue in the survey included factors associated with length of duty day, missed meals, lack of breaks, short layovers, and number of consecutive duty days. Many of these same issues were reiterated and rephrased in the current study. Overall, the results from the survey and our present content analysis of reported comments indicate that fatigue is an issue of significant concern in flight attendant operations.

Although these findings do supplement the survey results, they also provide a more in-depth perspective on the different types of operations and their differential contributions to fatigue. The results of this study suggest that flight attendants working for regional airlines may be experiencing some alternative fatigue factors that are not shared by low-cost and network operations. Seniority level may play a role, but the underlying reasons are not clear in this study. Future research may examine specific operational issues (i.e., number of segments, complexity of the aircraft fleet, complexity of position) and how they impact fatigue. A closer examination into the underlying causes for differences found by seniority level may also be warranted.

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APPENDIX A

Categories, Subcategories, and Issues

SCHEDULING
Duty Day
<ul style="list-style-type: none"> Satisfaction with schedule (not reserve) Dissatisfaction with schedule (not reserve) Too many consecutive duty days Duty day too long Satisfaction with high flight hours Dissatisfaction with high flight hours Too many legs/Segments/Swaps Impact of delays not considered Airports sits/Ground time too long Turn around/Ground time too short Inconsistent or early reports (mixed early/late) Late/No notification of schedule changes Impact of time zone not considered
Breaks
<ul style="list-style-type: none"> Adequate number of breaks/Amount of time for breaks Insufficient number of breaks/Amount of time for breaks
CDOs
<ul style="list-style-type: none"> Satisfaction with CDOs/Red-eyes Dissatisfaction with CDOs/Red-eyes Satisfaction with consecutive CDOs/Red-eyes Dissatisfaction with consecutive CDOs/Red-eyes
Reserves
<ul style="list-style-type: none"> Satisfaction with schedule (reserve) Dissatisfaction with schedule (reserve) Too many hours/Days on reserve Reserve sits too long/Late trips assigned Reserve notification time too short
Rest Periods
<ul style="list-style-type: none"> Rest period too short Transportation to/from rest accommodations should not be included in rest period
HEALTH
<ul style="list-style-type: none"> Fatigued/Exhausted Adequate amount of sleep/rest Inadequate amount of sleep/rest Air quality unhealthy/Lack of oxygen Physical health suffers due to job Stressed/Mental health suffers due to job
JOB PERFORMANCE and SATISFACTION
Compensation Satisfaction
<ul style="list-style-type: none"> Satisfaction with pay/Pay for time worked Dissatisfaction with pay/Pay for time worked Satisfaction with benefits Dissatisfaction with benefits
Job Satisfaction
<ul style="list-style-type: none"> Satisfaction with job/Type of work Dissatisfaction with job/Type of work

Safety/Job Performance
Fatigue impact on safety/Job performance Fatigue does not impact safety/Job performance
AIRLINE and AIRLINE POLICY
General
Satisfaction with airline/Airline concern for FA health and welfare Dissatisfaction with airline/Airline concern for FA health and welfare Difficulty with commute Dissatisfaction with uniform and shoe requirements Need age/weight/height requirements Able to call-in fatigued Unable to call-in fatigued Harassed/threatened when calling-in sick Inequity of pilot and FA work/rest rules Airline uses tricks, coercion, threats to exceed work/rest limits
Training
Training received/Good quality of training No training received/Poor quality of training
Work Environment
Dissatisfaction with Quality/Cleanliness of Work Area/Equipment
SURVEY
Appreciation of fatigue research/survey No appreciation of fatigue research/survey Satisfaction with survey content/structure/online functions Dissatisfaction with survey content/structure/online functions
MEALS
No facilities in-flight to store/Prepare personal meals Long periods without food/No time to eat/No food or water available Airline provides meals/Bottled water Airline does not provide meals/Bottled water Good quality of food available Poor quality of food available
WORKLOAD
Good staffing – FA to passenger ratio Poor staffing – FA to passenger ratio Carry-on baggage excessive Too many added duties Increased number of passengers/Full planes Deal with rude/disgruntled/unruly passengers
BREAK FACILITIES
In-Flight
Availability of in-flight break area/Adequate separation from passengers Unavailability of in-flight break area/Inadequate separation from passengers Uncomfortable/insufficient in-flight rest/Seats Availability of horizontal rest facilities (bunks) Unavailability of horizontal rest facilities (bunks)
Airport
Unavailability of airport break area/Insufficient separation from passengers Uncomfortable/insufficient crew room/Seats
Rest Accommodations (hotel)
Good quality/location/comfort of rest accommodations Poor quality/location/comfort of rest accommodations

APPENDIX B

Examples of Comments

Duty Days	Example Comments
Duty day too long	<i>Nobody should be forced to work 14, 16, 18 hours of duty time in a 24 hour period. We should not be working 16 hours in a duty day. That's crazy.</i>
Too many legs/segments/swaps	<i>Flight attendants should not have to fly over 4 legs per day. Five legs in one day is too much 'on duty' time... Six legs a day is too many, often I am the only FA on a 50 seat aircraft, and it is difficult to not make mistakes by the time you get to the 5th and 6th legs of the day.</i>
Impact of delays not considered	<i>Short layovers and several legs in one day are the most common culprits of increased fatigue. Add to these days, an emergency or delay and the fatigue increases substantially. The problem with all the weather delays makes a long duty time become even longer and then shortens our rest period.</i>
Inconsistent or early reports (mixed early/late)	<i>... the schedule is really inconsistent. An effort should be made to make an FA's schedule either mainly morning and evening. Early reports (before 6:35 am) should have duty/block reduced to 10 hr duty and 7 hr block. If I have to get up at 2:30 am to sign in and then get a 12 hr duty day followed by 9:45 layover, I'm in trouble.</i>
Breaks	
Insufficient number of breaks/amount of time for breaks	<i>...long flights (over 2 hours) should have a 15 minute break scheduled once we land. Even if we are late we should get this. Why do other jobs get required breaks and lunch hours but we don't?</i>
Rest Periods	
Rest period too short	<i>Layover rest periods or scheduled rest periods should never be shorter than the longest duty day. Biggest problem in my opinion; duty time at layover point should start when arriving at hotel not when plane blocks in!</i>
Transportation to/from rest accommodations should not be included in rest period	<i>Also the rest time should start when we get to the hotel and not when we arrive at the gate on the plane. There are times that we are waiting for almost an hour for transportation and it's completely out of our control as a crew. This rest also excludes travel time from hotel, which is becoming earlier and earlier due to increased traffic conditions everywhere. All of this equates to about 6 hours of sleep on a 9:45 scheduled overnight IF that person can fall asleep instantaneous!</i>

Example health issues comments

	Example Comments
Fatigued/Exhausted	<i>Flight Attendant fatigue is a serious and constant problem within the industry. Many times I have come from a trip feeling like I should have had paramedics waiting for me or at least a wheelchair, that's how exhausted I get.</i>
Inadequate amount of sleep/rest	<i>Many times, no matter what you do it is impossible to get more than 5 hrs of sleep, and that is just not enough. ...when I am so fatigued, it's harder for me to fall asleep, which requires more time for rest.</i>
Physical health suffers due to job	<i>I feel it is aging me and taking bigger toll on my health than any other job I have worked. I would not recommend this job to anyone who has their physical health as a priority. Flight attendants get sick more than people who work in offices, due to extremely bad hygiene with passengers. They fly with all sorts of complaints, flu, bad colds, etc. Unfortunately we pick up these bugs.</i>

Example Airline & Airline Policy Issue Comments

	Example Comments
Dissatisfaction with airline/airline concern for FA health and welfare	<i>I believe that our company has no regard for their flight attendants and their well being, especially in the scheduling department. I do wish they cared more about us as a flight attendant group and showed concern over our health and well being. There are individuals who are the exception and take an interest, but not enough to change the whole airline's way of thinking.</i>

Example Survey Issue Comments

	Example Comments
Appreciation of fatigue research/survey	<i>Thank you for conducting this survey as Flight Attendant health is a growing concern. I am so grateful that finally someone is doing this study.</i>

Example Meals Issue Comments

	Example Comments
Long periods without food/No time to eat/No food or water available	<i>We frequently have 4 legs with no time for eating or drinking which causes fatigue. No time between flights to eat, not enough water provided in flight to stay hydrated, and short layovers resulting in lost sleep.</i>
