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Norwegian airline passengers are not more afraid of flying after the terror act of September 11. The flight anxiety, however, is significantly attributed to acts of terrorism

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The aim of this paper is to study: (1) the prevalence of flight anxiety among Norwegian airline passengers; (2) situations that may be of concern during flights and situations not related to flying; (3) whether passengers feel more afraid after the terror act of September 11, 2001; and (4) whether passengers were more afraid in 2002 than in 1986. A questionnaire was distributed during domestic flights in Norway in 1986 and 2002. To assess flight anxiety, a six point scale was used, from 0 = not afraid at all, to 5 = always very afraid, and sometimes avoid flying because of that. A 10-cm visual analogue scale (VAS) was used to measure the degree of anxiety. There were 50.8% who were not afraid at all. There were 12 women (5.2%) and one man (0.4%) with flight phobia. However, 22 (4.5%) had cancelled flights because of anxiety during the last two years. Situations that caused most concern during flights were turbulence and fear of terrorism and highjacking. After September 11, 48% were not more afraid, 38% a little more, 10% moderately, 3% rather much and 2% very much. The passengers, however, were not more afraid of flying in 2002 than in 1986. About 3% of Norwegian airline passengers have a flight phobia. Women are significantly more concerned than men. The impact of the terror act September 11, 2001 was rather moderate. The level of flight anxiety among Norwegian airline passengers was not significantly different in 2002 and 1986.

Key words: Airline passengers, anxiety, flying, phobia, travel.

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INTRODUCTION

There are only a few studies on the prevalence of flight anxiety, especially among airline passengers. Most are population studies, where questionnaires are mailed to the subjects at home. We are only aware of one study among passengers made during flight (Ekeberg, Seeberg & Ellertsen, 1988). On the other hand, there are many studies on different kinds of treatment for those who suffer from flight anxiety (Van Gerwen & Diekstra, 2000).

In the study among airline passengers, (Ekeberg et al., 1988) found that 48% of the respondents reported some flight anxiety and 2% were considered to have flight phobia. Women were significantly more affected than men. In a study on the prevalence of flight anxiety in Norway, we found that some degree of flight anxiety was reported by 46% (Ekeberg, Seeberg & Ellertsen, 1989). There were 8% who were considered flight phobics, as they reported to be “always very afraid, but never avoid flying because of it” or “never fly because of flight anxiety,” 14% among women and 3% men. Nordlund (1983) found that 20–30% of the Swedish population experienced considerable discomfort on each flight, 50% were apprehensive about flying and 10% did not dare to fly at all. Arnarson (1987) found that less than 10% of males and about a quarter of female Icelanders suffered from intense fear of flying. Wilhelm and Roth (1997) found that 20–30% of the US population was apprehensive about flying. Fredrikson, Annas, Fisher and Wik (1996) found the point prevalence for DSM-IV (American Psychiatric Association, 1994) simple phobia (flying) to be 2.6%. In an old American study, Agras, Sylvester and Oliveau (1969) found that 20% had a moderate and 10% an intense fear of flying. A German study showed that 15% of the German population has this fear and that an additional 20% are apprehensive while flying (Mühlberger, Herrmann, Wiedemann, Ellgring & Pauli, 2001). In all these studies, women reported more flight anxiety. Ekeberg et al. (1988, 1989) found that discomfort was mainly caused by turbulence during flight and heights in situations other than flying. On the other hand, there are many studies on different kinds of treatment for those who suffer from flight anxiety (Van Gerwen & Diekstra, 2000; Van Gerwen, Diekstra, Arondeus & Wolfer, 2004).

Another topic to study is whether occurrences like the terror act of September 11, 2001 made passengers more afraid of flying. Many articles were written about September 11, but we have only found one related to fear of flying. Mühlberger, Alpers and Pauli (2005), found that the number of German airline passengers declined sharply in the months following the attacks. Most airlines in the US and Europe reported a noticeable decline in the number of passengers after the attacks, probably a consequence of this having been a prominent topic in the US and European
media. In Germany there was a 50–80% increase in cancellations due to passengers reporting sick in the four months after the attacks. Was this a result of increased fear of flying? Because they had coincidentally collected data for the standardization of the German version of the Fear of Flying Scale in the months before September 11, they were able to examine whether the prevalence of fear of flying increased in Germany as a consequence of the attacks. They found no evidence for an increase in fear of flying. They did not observe an increase in avoidance of flights, other specific flying-related fears, or trait anxiety in the wake of the September 11 attacks. Other studies have also shown a decline in airline passengers after September 11, among those Ito and Lee (2005) and Gigerenzer (2004).

The aims of this study are to investigate:

1. the prevalence of flight anxiety among Norwegian airline passengers;
2. how this prevalence relates to sociodemographic variables;
3. what kinds of concerns are related to flight anxiety during flights;
4. the passengers’ opinion about the frequency of flight accidents, the mortality when accidents occur and whether air traffic authorities do enough to ensure safety;
5. whether passengers feel more afraid after the terror act of September 11, 2001; and
6. were Norwegian airline passengers more afraid of flying in 2002 than in 1986?

METHODS

Procedure

The study was conducted during the period October 27–30, 2002, in cooperation with the Norwegian airline Braathens (later absorbed by SAS). This is the same airline as in the study in 1986 (Ekeberg et al., 1988). Fifteen Norwegian domestic flights were randomly selected to cover unequal days and all hours. On each flight, 50 questionnaires were to be distributed by the cabin attendants to random passengers while seated. They were informed to try to limit the distribution to passengers in the age group 18–70 years and to invite passengers seated on aisle, middle or window seats in front, middle or back in the cabin to get a representative sample. If there were less than 50 passengers, the number of distributed questionnaires should be registered in order to assess the response rate. The questionnaire contained 47 items. Ten items covered background variables like gender, age, marital and occupational status, number of children and flight habits.

Comparisons with the level of flight anxiety in Norway 1986 were made by using the same questionnaire (Ekeberg et al., 1988) in addition to new questions on the impact of the September 11, 2001 terror acts in the USA, safety measures at the airports and air safety.

Assessments

The questionnaire contained 47 items. Ten items covered background variables like gender, age, marital and occupational status, number of children and flight habits.

A 10-cm visual analogue scale (VAS) was used to measure the degree of 21 possible concerns in relation to a flight, like fire in an engine, engine trouble, foreign objects in the engine, unfamiliar sounds, terror acts etc. The end points (0 = no anxiety and 10 = maximum anxiety) were verbally anchored.

In addition, the subjects were asked to indicate their anxiety on the VAS for six situations not related to flying, namely, riding elevators, big gatherings, enclosure, walking across open spaces, traveling by bus/train and heights, as these are situations that commonly may cause anxiety without necessarily being related to flight anxiety.

The degree of flight anxiety was assessed on a six point scale ranging from 0 = not afraid at all, 1 = sometimes a little afraid, 2 = always a little afraid, 3 = sometimes very afraid, 4 = always very afraid, but never cancel flights because of that and 5 = always very afraid, and sometimes avoid flying because of that. Grades 4 and 5 were considered at the level of flight phobia. Those who were afraid should also answer three questions concerning (a) the duration of the anxiety, (b) whether the fear was caused by a frightening flight experience and (c) whether they became more afraid after having children (yes/no).

The passengers were asked if they had become more afraid of flying after the terror acts at the World Trade Center and Pentagon on September 11, 2001 and to what degree they feel that the airport staff and airline companies do enough to ensure safety, measured on a five point Likert scale from 1 = not at all to 5 = very much. Finally, there were two items about air safety. The passengers should choose one of seven alternatives and answer how often they believed that a passenger in an aircraft in scheduled traffic were involved in accidents and estimate the percentage of fatalities in an average plane crash.

Statistics

Comparisons between groups were made using student’s t-test, chi-square, Mann-Whitney U, Kruskal-Wallis and Pearson’s correlation coefficient. Data are presented as means ± SE. P < 0.05 was considered statistically significant. Data were analyzed with SPSS version 15 (IBM, Chicago, IL).

Ethics

The anonymous study was approved by the airline company SAS.

Table 1. Number of flights the last two years according to gender

|          | Men% | Women% | Total% |
|----------|------|--------|--------|
| 0        | 1.6  | 3.5    | 2.5    |
| 1–10     | 33.0 | 55.8   | 44.1   |
| 11–20    | 23.5 | 25.1   | 24.3   |
| 21–50    | 23.9 | 11.3   | 17.7   |
| More than 50 | 13.6 | 2.6 | 8.2 |
| Several times, but no specific number of flights | 4.5 | 1.7 | 3.2 |
| Total    | 100.1 | 100.0 | 100.0 |

There were 2.5% who had not flown during the last two years, whereas 8.2% had flown more than 50 times (Table 1).

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RESULTS

Prevalence of flight anxiety according to sociodemographic variables

There were 50.8% of the passengers who were not afraid of flying at all (Table 2). Thirteen passengers (2.8%) were in grades 4 and 5, and were considered to have flight phobia, 12 (5.2%) women and one (0.4%) man. Women reported significantly more flight anxiety than men (chi-square = 42.6, p < 0.001).

There were 22 (4.5%) who had cancelled at least one flight because of flight anxiety during the last two years, 17 women and five men. Thirteen of these passengers were in grades 0–3. Anxiety did not differ across age levels (≤29, 30–49 and ≥50 years).

Table 2. Degree of flight anxiety according to gender

|                     | Women% (n = 229) | Men% (n = 247) | Total% (n = 476) |
|---------------------|------------------|----------------|-----------------|
| Not afraid at all   | 36.7             | 64.0           | 50.8            |
| (Grade 0)           |                  |                |                 |
| Sometimes a little  | 45.4             | 30.4           | 37.8            |
| afraid (Grade 1)    |                  |                |                 |
| Always a little     | 10.0             | 4.5            | 7.1             |
| afraid (Grade 2)    |                  |                |                 |
| Sometimes very      | 2.6              | 0.8            | 1.7             |
| afraid (Grade 3)    |                  |                |                 |
| Always very afraid, | 3.1              | 0.0            | 1.5             |
| but never cancel    |                  |                |                 |
| flights because of   |                  |                |                 |
| that (Grade 4)      |                  |                |                 |
| Always very afraid, | 2.2              | 0.4            | 1.3             |
| and sometimes avoid |                  |                |                 |
| flying because of   |                  |                |                 |
| that (Grade 5)      |                  |                |                 |
| Total               | 100.0            | 100.1          | 100.2           |

Note: Grades 4 and 5 in bold are considered flight phobia.

Of the passengers, 310 (46.8% women) answered the question whether they had become more afraid of flying after having children. Significantly more women (21.4%) than men (3.0%) had become “quite much” or “very much” more afraid after having children (chi-square = 37.8, p < 0.001).

There were 84 (17.4%; 67% women) who answered the question whether they had become more afraid after a frightening flight, and 37.2% answered yes.

Situations that cause concern during flight

The scores for the passengers according to situations that cause concern during flight were significantly higher for women than for men (Fig. 1). The items with the highest scores were: turbulence 2.3, terrorism 2.2, highjacking 2.1, collision in air 2.1 and foreign objects in the engine 2.0.

The mean anxiety score according to situations other than flying was 1.0, significantly higher for women (1.3) than for men (0.7), t = 5.7, p < 0.001. The average scores were highest for heights (2.9), riding elevators (0.8) and enclosure (0.8). There was a medium, positive correlation (r = 0.31, p < 0.001), between the degree of flight anxiety and anxiety in other situations.

Passengers’ opinion about safety and flight accidents

Men felt significantly more confident that airline companies and airport staff do enough to ensure safety than women (3.7 ± 0.07 vs. 3.4 ± 0.08), t = 3.17, p < 0.01. There were 15.7% who thought that only “not at all” or “a little” was made, and 17.8% “very much.”

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flight phobia. Many other passengers experience some discomfort when flying, often related to specific situations, but not to the level of flight phobia. It was not possible to make a formal diagnosis of flight (specific) phobia with this study design. The fact that 4.5% of the passengers had cancelled at least one flight because of flight anxiety during the last two years indicates that the estimated level of flight phobia is a minimum figure.

As people with flight phobia fly less or not at all, the prevalence of flight anxiety is lower among airline passengers than in the general population. The finding of 2.7% with flight phobia in the present study and the findings of Ekeberg et al. (1988) that 5% of the general Norwegian population never fly because of flight anxiety indicate that Fredrikson et al.’s (1996) finding of 2.6% with flight phobia in the general Swedish population is most likely an underestimate. The prevalence is expected to be quite similar in the two neighbouring countries.

Women who fly are significantly more afraid than men. Their flight anxiety more often increased after having children than men’s. Women were also more afraid in situations other than flying. This is in accordance with the fact that symptoms of phobia and anxiety are more common among women than men (Van Gerwen & Diekstra, 2000). Fear and having a phobia is not the same, but reflect different levels of the same phenomenon. Women may be more willing to admit fears and phobias. The studies of Ekeberg et al. (1988, 1989), however, showed that women seemed to report the same level of flight anxiety when asked during flight or at home, whereas men reported somewhat more anxiety during flight. After correcting for this however, women still reported significantly more flight anxiety. Another reason may be that men fly more often than women, in particular related to their job. It is likely that those who fly most have less flight anxiety because they fly more.

Only 37% attributed their flight anxiety to a specific frightening flight. Thus, in the majority of cases, flight anxiety developed in the absence of a particular frightening event. This may indicate that there has been a general apprehension of flying that has been increasing. This is in accordance with the experience that anxiety often is related to the fear of new attacks of anxiety, that is, a negative snowball effect, even in the absence of a particularly frightening event. The finding that 70% of those with flight anxiety had been afraid for more than 10 years shows that there is a significant risk of chronic concerns for those who do not get help. We did not ask whether those who were afraid had been seeking professional help.

Turbulence, foreign sounds, terrorism and highjacking caused most concern during flight and nearly at the same degree. The finding that turbulence is of major concern is in accordance with previous studies (Ekeberg et al., 1988, 1989). The finding that the passengers were not more afraid than in 1986 indicates that the passengers are more inclined to attribute their anxiety to terrorism and highjacking, but that it has no effect on the total level of flight anxiety.

Heights caused by far the most concern in situations other than flying for both sexes, and particularly in women. This is also in accordance with phobia and anxiety being more common among women than men (Van Gerwen & Diekstra, 2000). In general, the level of anxiety in other situations was quite low. The moderate correlation between flight anxiety and anxiety in
other situations may indicate that many people experience flight anxiety without other concerns and vice versa.

The fatal accident rate per million departures for the worldwide commercial jet fleet 2002–2011 was 0.39 (www.boeing.com). Accordingly, 70.9% of the passengers had a realistic view of how often accidents happen. About 50% die in a flight accident (www.boeing.com). Among the passengers, there were 8.8% who believed that from 41%–60% perished, whereas the majority thought that over 70% died. Those with most anxiety also had the greatest assessment of the risk.

The degree of flight anxiety among Norwegian passengers was the same in 2002 as in 1986. The same questionnaire and method were used. This indicates that attribution is important, and that the passengers attribute their anxiety to terror acts like September 11, or other possible events. The safety associated with flights and airports is even better than in the 1980’s, where the last study was conducted. The number of flights has also increased significantly, but the level of anxiety among the passengers is the same.

**Strengths and limitations**

A strength of the study is that the questionnaires were distributed onboard the airplanes. It is most likely that the passengers’ answers are more reliable when they are studied in a real life situation. The same questionnaires and methods were used in the present study and the one from 1986. The response rate was also good. The random selection of flights with the same airline company is also a strength. The lack of a formal diagnosis of flight anxiety is a limitation. The degree of anxiety, however, can be reliably assessed without a diagnosis. Most likely, passengers who travel on international flights are less afraid of flying than those who make domestic flights. Accordingly, assessments on international flights should also be conducted. Some passengers do not board the aircraft because of flight anxiety. This does not happen on every flight, and the number is so small that it does not represent a significant bias.

**CONCLUSION**

A significant number of airline passengers are apprehensive about flying. Women are more afraid than men. Passengers are most concerned about turbulence, foreign sounds and terrorism/highjacking. The impact of the terror attacks on September 11 2001 is rather moderate and transient, and does not seem to have made passengers more afraid than before, even though more anxiety is attributed to terrorism. The prevalence of flight anxiety among Norwegian passengers was not different in 2002 compared with 1986.

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