# 20121024 - Sleep disruption on the Asia–Pacific route - 2010

[Data] [<Normal page] [**YIU Kam HP [ed] (2010).** *Sleep disruption on the Asia–Pacific route.* Journal of Knowledge Advancement & Integration (ISSN 1177-4576), 2012, pages 296-299.]

## Sleep pattern disruption



Lin, Qiu and Perezgonzalez *(2010[1])* presented the results of a study by Qiu *(2010[2])* examining the sleep pattern disruption suffered by a group of flight attendants working on an Asia-Pacific route. Results indicated that the rapid time zone transitions of about four hours affected the participants' sleeping pattern, and that a longer duration of their sleep did not necessarily indicate better sleep quality. Furthermore, on the first day of arrival, some participants elected to adopt the local time to cue their sleep. These participants had a shorter duration of sleep and found it harder to wake up the following day. However, after that first day, all participants showed similar sleep attributes despite the different sleep strategy.

Illustration 1 is a combined summary of the tabulated interpretations from the article when comparing sleep attributes against the group's mean.

**Illustration 1. Combined interpretations of sleeping attributes compared to the mean**

| | **Overall sleep quality** | **Average sleep duration** | **Average bed time** | **Average waking time** | **Mean waking time** | **Time required to fall asleep** | **Difficulty in falling asleep** |
|---|---|---|---|---|---|---|---|
| **Home** | Good quality of sleep | Long duration of sleep | Early bed time | Earlier waking time | Same as usual | Shorter time required to fall asleep | Less difficultly |
| **First layover sleep** | Good quality of sleep | Short duration of sleep | Late bed time | Later waking time | Less than usual | Shorter time required to fall asleep | Less difficultly |
| **Day 1 layover** | Poorer quality of sleep | Long duration of sleep | Average bed time | Average waking time | More than usual | Longer time required to fall asleep | More difficulty |
| **Day 2 layover** | Poorer quality of sleep | Average duration of sleep | Average bed time | Average waking time | More than usual | Longer time required to fall asleep | More difficulty |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Day 3 layover** | Poorer quality of sleep | Long duration of sleep | Early bed time | Average waking time | More than usual | Longer time required to fall asleep | More difficulty |
| **Day sleep (post flight)** | Good quality of sleep | Short duration of sleep | Late bed time | Later waking time | Less than usual | Shorter time required to fall asleep | Less difficultly |
| **Night sleep (post flight)** | Average quality of sleep | Average duration of sleep | Early bed time | Earlier waking time | Same as usual | Shorter time required to fall asleep | Average difficulty |

A slightly different table will result if the data is compared against home instead of the mean. While 'home data' is not the average, there are several benefits using the results from home as the benchmark for comparison:

- 'Home' has the most controlled environment of them all, there are less variables to consider. Noise, lightning, temperature and bedding comforts can be considered constant.
- Sleep attributes from 'home' are supposed to represent the most ideal figures, which makes it an excellent source to benchmark against.

Applying the same methodology above, the following table is the combined summary where 'home' is used for comparison instead of the mean. For ease of interpretation, the table is color coded. Green represents the same outcome, yellow represents a one-step change, and orange represents a two-step change (also resulting in opposite results to those stated in illustration 1).

**Illustration 2. Combined interpretations of sleeping attributes compared to 'home'**

| | **Overall sleep quality** | **Average sleep duration** | **Average bedtime** | **Average waking time** | **Mean waking time** | **Time required to fall asleep** | **Difficulty in falling asleep** |
|---|---|---|---|---|---|---|---|
| **First layover sleep** | Average quality of sleep | Short duration of sleep | Late bed time | Later waking time | Less than usual | Same time required | Less difficultly |
| **Day 1 layover** | Poorer quality of sleep | Average duration of sleep | Late bed time | Later waking time | More than usual | Longer time required to fall asleep | More difficulty |
| **Day 2 layover** | Poorer quality of sleep | Short duration of sleep | Late bed time | Later waking time | More than usual | Longer time required to fall asleep | More difficulty |
| **Day 3 layover** | Poorer quality of sleep | Average duration of sleep | Late bed time | Later waking time | Same as usual | Longer time required to fall asleep | More difficulty |
| **Day sleep (post flight)** | Good quality of sleep | Short duration of sleep | Late bed time | Later waking time | Less than usual | Same time required | Less difficultly |
| **Night sleep (post flight)** | Average quality of sleep | Short duration of sleep | Late bed time | Earlier waking time | Same as usual | Longer time required to fall asleep | More difficulty |

While at first sight it may seem as though some of the results are now contradicting (especially the ones highlighted in orange), it is not the case. Most of the changes can be explained due to the fact that the time zones have shifted, inevitably making bedtime and waking time appearing to occur

later when compared to the reference time at home. The difference in sleep duration between the two graphs are also not as significant as it might first suggest because the crew were allocated crew rest during their flight. One of the most interesting information that arises when comparing the two tables is the time required to fall asleep on the first day back (night). Whilst the results appear to be diametrically opposite; it tells us that compared to the mean of 55 minutes, the 33 minutes required to fall asleep is less than average, however, it is still twice as long compared to the 'home' time of just 16 minutes. Thus, this shows that the contradictions are not in any way in disagreement of each other but rather further highlights the disruption of sleep the authors reported. They also concluded that the first layover sleep was of better quality with less difficultly falling asleep compared to subsequent layover sleeps. Interestingly, this statement holds true if we compare it to either the mean or the 'home' measures.

---

# Methods

## Research approach

Exploratory study.

## Design

Non-experimental cross-sectional design. It follows a concurrent procedure which blends quantitative and qualitative data.

## Sample

A convenience sample of 20 Air NewZealand flight attendants operating on the New Zealand - China route *(Qiu, 2010[2])*. It consisted of 13 female and 7 male attendants, with age ranging between 25 and 45 years, job experience ranging between 8 months and 20 years, and with an average number of 71 hours per week flying this route.

## Variables

Variables of interest were those related to self-reported sleep patterns and quality of sleep.

## Materials

A self-reporting paper-based tool consisting of background information (questionnaire) and a standard survey for assessing sleep patterns for two periods (day and night sleep) during four days (diary). The questionnaire contained both quantitative (a five-point Likert scale) and qualitative data.

## Procedure

The questionnaire and survey was distributed to flight attendants before their departure from their home base (China). Flight attendants kept a sleep diary by completing the questionnaire and survey and rating their sleep pattern during five days, including layover days in New Zealand and the first day after returning home. Furthermore, they also reported their sleep patterns before departing China and New Zealand, as well as any sleep on the aircraft.

## Data analysis

Qualitative responses were coded and transformed into categorical variables. Quantitative variables were collated into an Excell spreadsheet and analysed with PHStat2 software program '*(Qiu, 2010[2]*

).

The main data analyses were descriptive statistics.

## References

1. **LIN Bo, Yifan QIU & Jose D PEREZGONZALEZ (2010).** *Sleep pattern disruption of flight attendants operating on the Asia–Pacific route.* Aviation Education and Research Proceedings (ISSN 1176-0729), 2011, pages 37-42.
2. **QIU Yifan (2010).** *Sleep patterns in flight attendants operating on the Asia-Pacific route between China and New Zealand. A questionnaire survey study of Air New Zealand China-based flight attendants.* Unpublished research project (Massey University, New Zealand), 2010.

# Want to know more?

**Harvard Medical School - The science of sleep**
This website offers an in-depth look into sleep.

---

## Editor

**Kam HP YIU (2012).** School of Aviation, Massey University. YIU Paulson

---



| Other interesting sites | | | | |
|---|---|---|---|---|
| Journal KAI | Wiki of Science | AviationKnowledge | A4art | The Balanced Nutrition Index |

page revision: 2, last edited: 24 Oct 2012, 10:29 (52 seconds ago)

---