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# Self-medication among fighter jet pilots: a national cross-sectional survey in the French Air Force


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## Background

The definition of self-medication is not unanimous throughout current literature, but some common principles stand out. It refers to **the use of a drug on one's own initiative for the purpose of care, without a medical prescription for the current event and with possible help from others** (healthcare professionals or family and friends).
In France, self-medication concerns 53.5 to 84.4% of the general population.
Several factors have been mentioned in the literature as being associated with greater self-medication:
- The age group of active adults, i.e. between 30 and 50 years of age
- A higher level of education (from the baccalaureate and increasing with the years of study)
- Living in an urban area
- Social vulnerability
- Active smoking and chronic alcohol consumption
- Chronic diseases

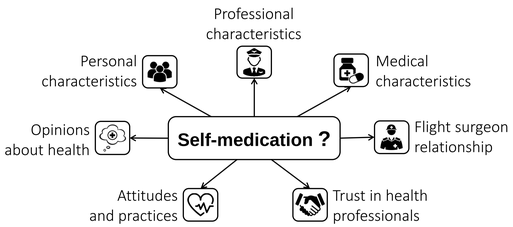
Self-medication allows a greater accessibility of the drug and a decrease in medical visits, with a better self-monitoring by the patients. However, there is a significant risk of unintentional or voluntary misuse with adverse health effects that can interact with each other if taken multiple times. There is a risk of inaccurate self-diagnosis and this is an additional cost for the patient.
Self-medication is a real benefit-risk balance for the patient. And its major risk lies in the high risk of side effects. Even more if it is a high-risk profession with significant aeronautical constraints, such as the profession of fighter jet pilots.
However, the French literature on self-medication, specifically in the fighter jet pilot population, is very scarce, is essentially centered on naval aviation and dates back more than 15 years (Sicard 1989 on 36 naval aviation, Sicard 1996 on 57 naval aviation, Monteil 2000 on 25 naval aviation), with a self-medication rate between 33% and 71%.
The last study on a French military pilot population dates from 2009 but only included 12.5% of fighter jet pilots, with a self-medication rate of 56.3%.

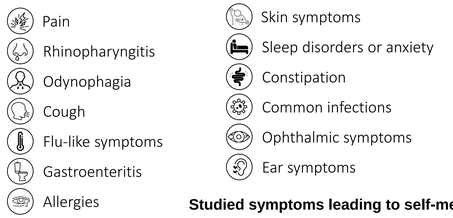
The main objective of this work is **to identify the factors that explain the practice of self-medication in French Air Force fighter aircrews**.
Secondary objectives are to quantify the practice and the frequency of self-medication and to provide insights about self-medication and flight safety

## Method

In order to study the self-medication in fighter aircrews, we decided to perform a **multi-center cross-sectional study**
The included population was composed of all Fighter Pilot or Combat System Officer in the French Air Force, Flying unit in metropolitan France who volunteer for participation.
We decided to exclude AM with "Subscription" aeronautical activity, presentation team, reserve squadron, drone squadron and AM from flying unit in a foreign country.

A specific **questionnaire** was created for this study in order to have:
- Set of questions relating to 7 explanatory hypotheses, with 5-point Likert scales
- In-flight adverse drug reactions' rate
- Self-medication rate in the 8 hours preceding a flight
- List of drugs consumed in the 8 hours preceding a flight




**Studied symptoms leading to self-medication**

**I have no financial relationships to disclose. I will not discuss off-label use and/or investigational use in this poster**

## Results

Our population is composed of **170 AM:**
- 34% respondents
- 98% male
- mean age 34 +/- 5.3yo.

### Professional characteristics

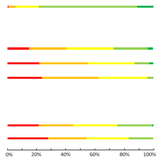
| | |
|---|---|
| Seniority in the French Air Force | 14 ± 5,3 years |
| Flight hours | 2024 ± 1061 hours |
| Function on board | |
| Fighter pilot | 78% |
| Combat System Officer (CSO) | 22% |
| Higher qualification | |
| Junior Pilot / CSO | 12% |
| Operational Pilot / CSO | 9% |
| Deputy Patrol Leader / Deputy Chief CSO | 14% |
| Patrol Leader / Chief CSO | 65% |

### Attitudes and practices

To wait for it to spontaneously disappear

To have an appointment with:
- A flight surgeon
- A civilian general practitioner
- Another health care professional

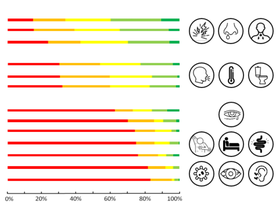
To use a self-medication with:
- An OTC drug purchased for the current episode
- A drug from the personal pharmacy




**attitude when faced with a common health problem**

**Self-medication:**

### Attitudes and practices




**97.6%**
Self-medication use when facing a common health problem

- Rare or no self-medication: n = 91 (53.5%)
- More frequent self-medication: n = 79 (46.5%)

- "Never" use self-medication
- "Rarely" use self-medication
- "Sometimes" use self-medication
- "Often" use self-medication
- "Always" use self-medication

**Explanatory model of self-medication in the FAF aircrew population**

| | | |
|---|---|---|
| Age class 35-40 | OR = 0.27 [0.09 – 0.78] | p = 0.02 |
| Age class > 40 | OR = 0.15 [0.03 – 0.59] | p < 0.01 |
| Function of pilot | OR = 2.99 [1.08 – 8.93] | p = 0.04 |
| To have a background treatment | OR = 5.65 [1.13 – 36.6] | p = 0.04 |
| Not paying attention to getting enough sleep | OR = 3.17 [1.16 – 9.27] | p = 0.02 |
| Not assuming to be the best person to know what medications are right for you | OR = 0.15 [0.03 – 0.6] | p < 0.01 |
| High confidence in the medical profession | OR = 4.70 [1.65 – 14.97] | p < 0.01 |

*Adjusted on clinical situations: pain, rhinopharyngitis, odynophagia, gastroenteritis*

**Consequences on flight safety:** self-medication in the 8 hours preceding a flight, in-flight side effects, used drugs

### Flight safety

- In-flight adverse drug reactions: 1.8%
- Fighter aircrew thinking that there may be medications incompatible with the flight: 93%

**45.9%**
Self-medication use when facing a common health problem in the 8 hours preceding a flight

### Flight safety

| Rank | INN | Route | Number | (%) |
|---|---|---|---|---|
| 1 | Paracetamol | Oral | 59 | (76%) |
| 2 | Ibuprofen | Oral | 12 | (15%) |
| 3 | Doesn't remember | N/A | 8 | (10%) |
| 4 | Pseudoephedrine | Oral | 8 | (10%) |
| 5 | Niflumic acid | Dermal | 4 | (5%) |
| 6 | Prednisolone | Nasal | 4 | (5%) |
| 7 | Diosmectite | Oral | 4 | (5%) |
| 8 | Loperamide | Oral | 4 | (5%) |
| 9 | Phloroglucinol | Oral | 4 | (5%) |
| 10 | Non specified nasal spray | Nasal | 3 | (4%) |
| 11 | Oxymetazoline | Nasal | 3 | (4%) |
| 12 | Salt water nasal spray | Nasal | 3 | (4%) |
| 13 | Desloratadine | Oral | 3 | (4%) |
| 14 | Racecadotril | Oral | 3 | (4%) |
| 15 | Tripolidine | Oral | 3 | (4%) |
| 16 | Betamethasone | Dermal | 2 | (3%) |
| 17 | Essential oils | Nasal | 2 | (3%) |
| 18 | Camphre | Nasal | 2 | (3%) |
| 19 | Ascorbic acid | Oral | 2 | (3%) |
| 20 | Alpha-amylase | Oral | 2 | (3%) |

Ranking of the 20 most used self-medication drugs in the 8 hours preceding a flight

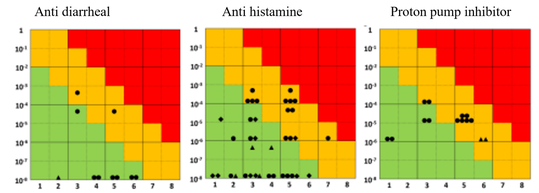
## Discussion

This study shows that 97.6% of the flying personnel of the French Air Force's fighter units have already used self-medication. However, this practice does not seem to be very common since its average frequency was low in 53.5% of cases, which could be comparable to results from the literature, with a self-medication in fighter pilots reported to be between 24 and 56%.

**Typical profile of the French fighter jet pilot who usually self-medicate:**
- A pilot: no data in the literature had previously identified this factor. It should be noted that the majority of respondents were pilots (78%) and that the p-value for this factor was close to significance
- Under 35 years of age: the data in the literature are mixed, but it appears that the active population (people between 30 and 50 years of age) would self-medicate the most.
- Taking a background treatment: data in the literature would lean towards this characteristic. However, the fighter jet pilot with background treatment in our study represented a very small group (n = 12) and the p-value was also close to significance
- Not paying particular attention to getting enough sleep was associated with more frequent self-medication. There are few data on the relationship between lifestyle and self-medication. A study in Spain on the general population in 2006-2007 found that nights of less than 7 hours of sleep were associated with a more frequent practice of self-medication in men
- Who have more confidence in the medical profession: This result is unexpected since the few data from the literature on this subject are summarized in an Iranian bibliometric systematic review in 2014, which instead reported low confidence in medical services or lack of confidence in physicians as factors favoring the practice of self-medication. The PDRQ-9 score, which measures the quality of the doctor-patient relationship in primary care, was not associated with more frequent self-medication practice.
- The more frequent practice for common health problem would be pain, nasopharyngitis, odynophagia or acute gastroenteritis: this data is validated multiple times on different studies.

**Limits of the study**
First, the participation rate was about 34%, i.e. about 1/3 of the flying personnel of the French Air Force fighter units, which could imply a lack of power in the identification or exclusion of explanatory factors for the practice of self-medication. A recruitment bias could also be evoked, since the proportion of fighter pilots flying a Rafale was 33% against 50% expected at the time of the study design. Finally, a recall bias, usual in retrospective studies, cannot be ruled out.

**Perspectives:**
The practice of self-medication concerns almost all fighter jet pilot but its impact on flight safety remains uncertain. Several processes have been developed for risk analysis in an industrial environment, such as the FMEA method (Failure Mode and Effects Analysis). The calculation of the risk is based on the postulate that "the criticality of the risk is the product of its frequency, its potential gravity and its level of detectability". We could implement a means of assessing the flight safety risk of self-medication in our study fighter pilots using a modified self-designed FMEA method.
The starting assumption was that each adverse event reported in the monograph of any of the medications used within 8h before a flight was considered a possible failure. The probability of occurrence of an adverse event was defined as its frequency of occurrence reported in the French monograph of the drug, multiplied by the rate of consumption of that drug in the 8h preceding a flight in our study.




**Risk matrix of neurological (black dot), cardiovascular (black square) and ophthalmological (black triangle) adverse events described in the monographs of the molecules consumed in the 8 hours preceding a flight by the subjects (n = 170)**

Example of risk matrix with on the abscissa the variable in classes of severity according to the score we defined, and on the ordinate the frequency with a logarithmic scale. Colored colors were applied according to the degree of criticality of the risk (red = not tolerable and corrective actions to be taken immediately, orange = tolerable but corrective actions to be taken, green = acceptable).

## Conclusion

For the aircrew who responded to this study, almost all of the FAF fighter jet aircrews have already used self-medication when facing a common health problem, but the frequency of its use is not systematic. Despite that some findings remained consistent with previous data, this practice is probably the result of complex interactions between many explanatory factors, including personal characteristics, opinions, attitudes, and practices when facing a common health problem. These results are likely to be of interest for the development of targeted prevention messages. In particular, they could be used as the basis for instruction for flight surgeons during their initial and post-graduate education, fighter aircrews during aeromedical instructions or consultations and FAF decision makers.

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