

Psycho-Active Pharmaceuticals and Military Performance in an Ethical Perspective

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ABSTRACT

Human performance technologies include among others the use of psycho-active pharmaceuticals. In trying to answer the question if the use of psycho-active pharmaceuticals in the military is ethically acceptable, a psycho-medical model with four guiding questions is discussed. From two examples of modern warfare with these guiding questions, it is concluded that an ethical use of psycho-active pharmaceuticals is possible. Also three additional points of view are discussed. Firstly, a human performance perspective on manned weapon systems is presented, next to the psycho-medical model. From this human performance perspective it is recommended to make military personnel and their commanders aware of the detrimental effects of fatigue and exhaustion on vigilance and decision making. Secondly, the quality of life of military personnel is introduced as a criterion for the ethical use of psycho-active pharmaceuticals. It appears that performance and quality of life can be addressed simultaneously in manned weapon systems. Thirdly, it is recommended to continue the discussion on ethical use of psycho-active pharmaceuticals by feeding it with empirical data from randomized controlled field studies, in stead of examining cases and logical reasoning only.

1.0 INTRODUCTION

Psycho-active pharmaceuticals are an important part of human performance technologies. These technologies aim to increase human performance and include for instance the use of devices for human audiovisual capacities, like seeing, hearing or situational awareness. More historical examples are binoculars. Military research and development has a long and strong record in developing technologies to enhance human performance. Around the Second World War Radar and Sonar were developed for detection of airplanes, ships or submarines at large distances. More recently night vision goggles were introduced to enhance human vision at night. The military developed the Global Positioning System for enhancement of situational awareness, which is now also widely used in civilian society for routing cars and trucks from electronic maps.

Psycho-active pharmaceuticals also have been developed and used in the military. Amphetamines have been used in the military since World War II to aid military personnel in combating fatigue and the effects of sleep deprivation (Wolfendale, 2008). Modafinil or Provigil is developed to be the modern replacement of amphetamine and is used in the United States Air Force (Caldwell 2007, Moreno 2008). After claims that this use has links with some friendly fire incidents in military operations in Afghanistan in 2002 (Bower, 2003) this use is under some scrutiny. Russo (2006) formulates the following four questions to aid military leaders in making ethically acceptable decisions in the use of psychoactive pharmaceuticals: Is the use truly voluntary, is the medication safe for use in this individual in his operational environment, is the use of the medication consistent with its dosage and pharmacological function and have non

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pharmacologic alternatives fully been utilized? If these questions can be answered affirmatively, the commander's decision to make use of a pharmaceutical is ethically acceptable.

The four questions are answered affirmatively in an example in which a soldier asks for sleep medication during an intercontinental transit flight in a military aircraft of many hours, crossing multiple time zones.

In a second example a small military unit is cut off from their main unit and is surrounded by the enemy. Reinforcements will only arrive the following day. Under the assumption that if the surrounded soldiers fall asleep, they will be overrun and killed, the use of amphetamine and caffeine is also ethically acceptable.

However, the use of a sleeping drug in the first example can be argued by criticizing the extent to which non pharmacological alternatives have been utilized. Do military personnel make use of active noise reduction equipment? Is there sufficient room for resting, sitting or walking? Is there an adaptation period included in the deployment scheme, which allows to adapt to the difference in time zones? The assumption in the second example asks raises questions also. How realistic is the assumption that soldiers will fall asleep within 24 hours under a condition of permanent life threat? And what to do if the promised reinforcements do not arrive the following day. Will more use of psycho-active pharmaceuticals sustain performance or lead to irreversible exhaustion, followed by collapse? Is the use of psycho-active pharmaceuticals better enhancing sustainability than the military routine of rest for the entire unit and watch keeping by a few unit members on a rotation scheme?

We would also like to introduce a preliminary question, before answering the 4 questions, asked by Russo: Is the psycho-active pharmaceutical really enhancing military performance? This question focuses on the human performance perspective on manned weapon systems.

2.0 A HUMAN PERFORMANCE PERSPECTIVE ON MANNED WEAPON SYSTEMS.

The ultimate goal of armed forces is to produce combat power, that enables them to secure, defend and if necessary attack with the potential or actual use of mass violence. This power is a potential, ready to be used in conflict situations. In order to create this potential, armed forces enlarge their combat readiness as much as they can. This combat readiness consists of material readiness, personnel readiness and training level (De Both, 1984). The time that military personnel are part of a military unit also contributes to operational readiness, especially by an increase of training level of the operational unit (Meijer, 1998).

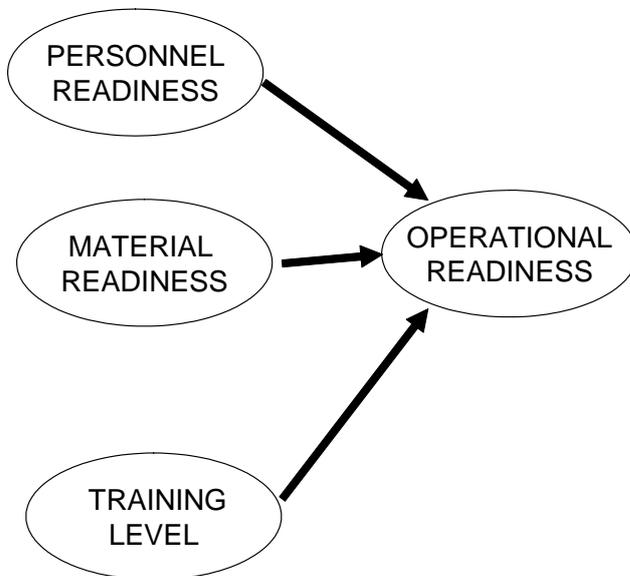


Figure 1. Constituents of operational readiness: personnel, material readiness and training level (Meijer and De Vries, 2005).

From figure 1 it appears that operational readiness consists of personnel readiness, material readiness and training level of an operational unit. The personnel readiness of a unit depends of sufficient numbers of personnel, with the right skills and experience and a good health. The application operational readiness in a theatre of conflict or war defines the ultimate performance of the operational unit. Especially when this performance is studied in sustained operations, effects of exhaustion, fatigue and sleep loss have to be accounted for. Operations consist of different stages, like the initial entry stage, the accommodation stage, the maintenance stage and the end stage. At a first glimpse, especially the initial entry stage and end stage are likely to induce operational fatigue. However, studying effects of operational fatigue in operational conditions implies risks, both for the researcher and subjects, so much research is done in laboratory settings.

Angus et al (1979) studied the relation between vigilance performance and REM sleep deprivation in 16 subsequent nights in arctic conditions. They concluded that REM sleep deprivation is related to a decrease in vigilance performance. Haslam (1984) reported that in sustained field training conditions military effectiveness is lost after 48-72 hours without sleep. Angus and Heslegrave (1984) reported an unacceptable level of military performance in cognitive tasks after 32 hours without sleep. Baranski, Pigeau and Angus (1994) concluded from experiments with cognitive tasks in a laboratory settings over 72 hours that performance declines but that subjects are able to judge this decline in performance accurately. Lagarde et Batejat (1999) reported a significant decrease of vigilance performance in a laboratory setting after 39 hours without sleep, which at least partly could be compensated by caffeine intake. Lagarde et al (2001) demonstrated positive effects of slow release caffeine and of melatonin on physical performance of United States Air Force Reservist after a transmeridian eastbound flight over 7 time zones. From observations of a training unit of the Royal Netherlands Marine Corps in field

conditions over 144 hours it appears that subjective effects of operational fatigue like exhaustion, muscle discomfort and alertness remain on the same level. Objective effects of operational fatigue lead to a dramatic decrease in vigilance performance during watch keeping duties during the third, fourth and fifth night of the field exercise (Van den Berg,1995). Subjects missed the majority of triggers for attention, which in operational setting induce the hazardous situation that enemy actions are not detected in the earliest possible stage, giving the enemy a very dangerous advantage. The subjective effects of operational fatigue do not correlate with the objective effects of operational fatigue in that study (Meijer and De Vries, 2007). Most likely subjects underestimate the objective consequences of fatigue, as their perception is impaired by fatigue as well. This resembles the effect of alcohol on performance. Subjects are not able to judge their decreased performance, because their perception and decision making is impaired by the alcohol also. Military commanders have to be aware of these effects of fatigue on themselves and their personnel, especially in sustained military operations.

3.0 QUALITY OF LIFE IN MANNED WEAPONS SYSTEMS

The most natural and effective way to compensate the effects of operational fatigue is to provide rest and recuperation. Angus et al (1979) report increase in vigilance performance as the deprivation of REM sleep is compensated by recovery sleep. As operational fatigue is easily induced by operating manned weapon systems day and night and in all weather conditions, the human need for rest and recuperation within these systems will increase. The possibility of rest and recuperation in manned weapons systems depends on the quality of life that is feasible in these systems. As such, quality of life in manned weapons systems contributes to the operational performance of these systems.

The asymmetric trend in modern warfare increases the amount of interaction with civil population, the risk of collateral damage and the constant threat of sniper attacks and attacks by improvised explosive devices. This makes the need for optimal vigilance of all crew in manned weapons systems even more critical, which also benefits from the quality of life in these systems. The enlarged impact of manned weapon systems by technical superiority asks for superiority in human performance also, especially in vigilance communication and decision making. The superior fighting power of the USN Vincennes made it possible to intercept a perceived hostile airplane before it could harm this manned weapons system. However, the airplane appeared to be an Iranian airliner with more than 200 civilian passengers on board. A reconstruction of the decision to intercept the airliner showed that crew members had made mistakes in checking the take-off time tables of the airport of departure, in controlling the Identification Friend or Foe systems, in communicating with the airliner and in interpreting the data on speed and height of the airliner. Why so many mistakes are made remains an unanswered question. The ships crew had been involved in surface warfare actions for prolonged hours of time. Prevention of such failures by the use of psychoactive pharmaceuticals have been used, especially before the question is answered if such drugs improved their performance. Until proper proof of the enhancement of operational performance is given and widely recognized, any human failure by crews of manned weapons systems, who were using psychoactive pharmaceuticals, will damage the operational output of these systems dramatically. As the impact of manned weapon systems increases and becomes more visible by the world wide operating mass media, more conscientiousness is needed in operating these manned weapon systems. Psycho-active pharmaceuticals are more likely to damage the performance of these systems than to improve this performance, at least at the level of perceived reliability and accountability of manned weapon systems.

4.0 TWO RECOMMENDATIONS FOR THE WAY AHEAD IN THE ETHICAL USE OF PSYCHO-ACTIVE PHARMACEUTICALS

The first and most important recommendation for an ethical use of psycho-active pharmaceuticals is to enlarge the evidence base of their effects on performance of manned weapon systems. The research to enlarge this evidence base has to focus both on subjective and objective effects of operational fatigue. The masculinity culture in most armed forces easily leads to a neglect of objective performance measures, such

as vigilance or decision making. The saying in many armed forces was: ‘ better make a wrong decision, than no decision at all’. The increased power and impact of manned weapon systems, more often used and more used in urban theatres does not support this saying anymore. When research on the use of psycho-active pharmaceuticals in manned weapon systems demonstrate positive but only subjective effects on performance this use should be stopped immediately, as overestimating one owns performance leads to unacceptable risks, both for personal safety and operational performance. In addition to that the well known subjective effects like outbursts of anxiety and nervousness already contra-indicate the use of those stimulants in manned weapons systems.

The research should be carried out in random controlled field trials. Random refers to the random attribution of subjects to experimental conditions, in order to overcome individual differences. Controlled refers to the control of the results in the experimental condition the results of a non intervention condition. And field refers to a situation that resembles the operational theatre at a maximum. Field training conditions give good possibilities for this research, especially when units are trained as they fight.

The second recommendation for an ethical use of psycho-active pharmaceuticals comes from the need to estimate their effects both on the performance of manned weapon systems and the quality of life in manned weapon systems. In the theatre of operations, sustainability of operational performance is critical, which brings in the need for optimal rest and recuperation conditions within manned weapon systems. Too much human resources are wasted in overcoming the unnecessary lack of space, noise, heat and cold and vibrations within these systems.

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