

*Original Article*

## Dimensions of psychological well-being and personality in military aircrew: A preliminary study

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### **ABSTRACT**

Operations during war and peace time require aircrew to be proficient in a wide range of skills which call for high physical and psychological stamina. Mental fitness plays a crucial role in helping the crew adapt to the occupational demands. How well the fliers perceive themselves i.e. their health and well being determines success, the future well-being and readiness of the force. Psychological literature has demonstrated that perceptions of Psychological Well-Being (PWB) are directly linked to the intensity of coping efforts and performance. PWB is defined as a person's evaluative reaction to his or her life-either in terms of life satisfaction (cognitive evaluations) or affect (emotional reaction). Negative perceptions and expectations of PWB are associated with decreased positive affect and with less adaptive and coping efforts, and could erode feelings of mastery and hope in fliers. Thus the aim of this preliminary investigation was to identify the general level of PWB in fifty (50) military aircrew and to find the association between PWB and personality. The PWB was measured using three outcomes: The WHO (Five) Well-Being Index, the Satisfaction with Life Scale and Positive Affect and Negative Affect Scale. Personality was measured using the NEO-FFI. The results indicate that the aviators perceive themselves to have average quality of life and PWB. They manifested high levels of neuroticism and very high levels of extraversion. This study emphasizes that health care providers must have a clear understanding about the level of PWB and personality make-up of the aircrew. Also predictions of PWB and personality have important practical implications, in selection, training and later aircrew performance.

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**Key words:** Psychological well-being, neuroticism, extraversion, aircrew

World Health Organization defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" [1]. Psychological Well-Being (PWB) of military aviators is important in the best interest of the employer - the armed forces and the country at large. Operations in an air force require aircrew to be proficient in a wide range of skills which call for high physical and psychological stamina. Mental fitness plays a crucial role in helping the crew adapt to the occupational demands. The stressful nature of contemporary work settings are indispensable and air warriors face a climate of increasing work demands coupled with declining resources. How well the fliers perceive themselves i.e. their health and well being determines success and the future well being and readiness of the force.

In the recent times there has been an increased interest in the study of PWB which follows from the recognition that the field of Psychology since its inception, has devoted much more attention to human unhappiness, suffering, behavioral problems and other psychological problems than to the causes of positive functioning or studying subjective well-being or satisfaction with life otherwise known as happiness [2,3]. This new movement in psychology stresses building human strengths and focuses more on positive vs. negative behavior.

Well-Being has a self propagating quality to

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it: feeling good predisposes one to respond to beauty, warmth of feeling and most importantly takes cerebral challenge in a positive way. Psychological Well-Being (PWB) is defined as a person's judgment or evaluation to his or her life—either in terms of life satisfaction (cognitive evaluations) or affect (emotional reactions) which is further divided into pleasant affect (positive feeling) and unpleasant affect (negative feeling). Negative perceptions and expectations of PWB are associated with decreased positive affect and with less adaptive and coping efforts, eroding feelings of mastery and hope in the fliers.

There were studies which indicated that PWB and mental health of military personnel is important and directly linked to coping efforts and performance during peace time and combat operations. Abundance of literature supporting the relationship between PWB and physical health has spurred a growing interest as to how different forms of PWB can impact one's physical health and performance. The mental health of the military personnel has been investigated primarily in terms of inpatient psychiatric diagnosis or psychiatric interviews. In this context research was also taken up by the United States Air Force (USAF) to characterize the PWB. A study [4] was carried out to characterize the PWB of USAF fliers using Berkman's adoption of Bradburn's PWB scale. It was found that flying officers and non flying officers had identical PWB and had uniformly better PWB than the comparably aged general people of Alameda County Group. The study also revealed that high PWB was positively correlated with better self assessed health and PWB seems inextricably related to flier's overall health, an important correlate of performance.

In many countries along with personality variables, PWB has been among the individual differences factors considered in the selection and

screening of military personnel [5, 6]. According to Cigrang et al [7] problems relating to mental health play a crucial role in a significant portion of the turnover or discharge within the first six months of enlistment in the US armed forces.

With regard to personality and PWB, Scholtz [8] reported that personality factors such as conscientiousness and neuroticism were significantly correlated with PWB and that both PWB and personality measures had a significant relationship with interpersonal and organizational deviance in Canadian Forces. A study [9] was done to examine the nature of the relationship between personality variables and PWB within work context for the non-commissioned officers in the Turkish Armed Forces. The study found that two job specific personalities' constructs, military demeanor and military efficacy, predicted that mental health was an important variable in selection process and the former construct had a stronger association with psychological well-being.

Extensive research [10] carried out on PWB in military personnel during combat has evidence that deployment history is a significant factor in understanding soldiers' PWB. In a study [11] on military personnel working in Falklands, results showed that majority of the participants appeared to make the best of the situation by engaging in positive thinking and acceptance of situation. In another study [12] which aimed to evaluate PWB on navy personnel, on active combat duty during Operation Enduring Freedom, revealed that the personnel had disturbing levels of anxiety and reported suicidal ideation at alarming rates of 2.4% in pre-deployment phase, 4.9% in mid-deployment and 3% in post- deployment phase. Another research [13] investigated the effects of stressors on individual outcomes like well-being, attachment, readiness critical to the functioning of military units and found that the stressors intensified the effects

on morale and commitment in a negative path and depression in an upward spiraling trend.

The situation in India is different. Though the primary duty of the Indian Air Force (IAF) is to defend the country from external threat, they are also actively involved in low-intensity conflicts and in rescue activities during disasters. In recent times, with improved technology, continuing guerilla warfare and terrorist actions, unique stressors may confront warriors when there is no safe place and no safe role. They are required to maintain unprecedented degree of vigilance and to respond continuously to threats and this may therefore affect their PWB.

However there has been no study on the PWB and its dimensions among Indian aviators. This study was thus taken up as a preliminary study and aimed at : (a) identifying the general level of PWB of IAF pilots and (b) to examine the association between PWB and personality.

**Material and Methods**

A group of 50 male pilots participated voluntarily in this study from April-July 2007 at IAM, IAF, Bangalore. All the pilots who participated in this study were fully fit in A1GI category. The demographic characteristics of the group are as shown

in Tables 1, 2, 3 and 4 respectively.

The following psychological questionnaires were used for the present study.

(a) Neo-FFI [14]. This test contained 60 statements which give the indication of the extent of the presence of each of the five dimensions of personality in the individual. These five dimensions include Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness. Neuroticism is defined as tendency to experience unpleasant emotions easily, such as anger, anxiety, depression, or vulnerability; sometimes called emotional instability. Extraversion is defined as energy, positive emotions, surgency, and the tendency to seek stimulation and the company of others. Openness is appreciation for art, emotion, adventure, unusual ideas, imagination, curiosity, and variety of experience. Agreeableness is a tendency to be compassionate and cooperative rather than suspicious and antagonistic towards others and conscientiousness is a tendency to show self-discipline, act dutifully, and aim for achievement; planned rather than spontaneous behaviour.

(b) Satisfaction With Life Scale (SWLS) of Diener. [15]. This test has five statements and gives

**Table 1: Average mean values of the demographic characteristics of the group of aviators (N=50)**

Characteristic	Average Mean	Std. Deviation
Age	32.50	6.25
Education (yrs)	15.02	0.58
Service (yrs)	10.70	6.69
Flying Hours	1730.30	1215.60

**Table 2: Sample distribution of the officer ranks (N=50)**

Rank	Number of officers	Percentage (%)
Flying Officer (FgOffr)	5	10
Flight Lieutenant (Fit Lt)	10	20
Squadron Leader (SqN Ldr)	18	36
Wing Commander (Wg Cdr)	17	34

**Table 3: Sample distribution of the aircraft stream (>=50)**

A/C Stream	Number	Percentage (%)
Fighter	27	
Transport	3	6
Helicopter	20	

**Table 4: Sample distribution of marital status fN=50)**

Marital Status	Number	Percentage (%)
Married	40	80
Single	10	20

a global measure of life satisfaction. It is an over all judgment made by the subject regarding his life satisfaction.

(c) W.H.O (five) Well-Being Index (1998 Version) [16]. This test has five statements and indicates the level of PWB that the subject has perceived about himself.

(d) Positive Affect and Negative Affect Scale (PANAS) [17]. of Watson, has twenty statements that describe different feelings and emotions.

(e) Marlowe-Crowne Social Desirability Scale [18]. This is a 33- item questionnaire and gives a measure of the subject's authenticity in responding to the questionnaires.

A good rapport was first established with the aviator after which, the informed consent was obtained and then the self-reporting questionnaires along with the demographic inventory was handed over. On NEO-FFI, the subjects were told to indicate how much they agreed or disagreed with each statement on a five point Likert scale from "strongly agree", "agree", "neutral", "disagree" and "strongly disagree", and mark the point in the scale. They were instructed to give their first and natural response to the statements and answer them truthfully and carefully. On SWLS the subjects were required to indicate their agreement with each item on a seven point scale from "strongly disagree",

"disagree", "slightly disagree", "neutral", "slightly agree", "agree" and "strongly agree". On W.H.O (five) Well-Being Index, the subjects had to indicate how they have felt over the last two weeks on a six point scale "at no time", "some of the time", "less than half of the time", "more than half of the time", "most of the time" and "all of the time". The subjects were requested to fill up PANAS as to what extent they felt in a particular way during the past week on a five point Likert scale from "not at all", "a little", "moderately", "quite a bit" and "extremely". Finally the subjects were requested to respond to the Marlowe-Crowne Social Desirability Scale by indicating whether they felt "true" or "false" for each item.

The questionnaires were then hand scored. The scores on each of the five dimensions of the NEO-FFI were computed using the scoring key provided.

The scores on SWLS were computed by adding up the responses given by the subject on each statement. The W.H.O Well-Being Index was computed by summing the responses given by the subject on each statement of the questionnaire. The score between 0-13 indicates poor quality of life and on the verge of psychopathology or depression while the score between 14-25 indicates the subjects' average to good quality of life. The positive affect (PA) score and the negative affect (NA) score were tabulated separately for each subject

by summing the responses on positive words and summing the responses given on the negative words respectively on PANAS. The maximum PA score a subject could score is 50 and minimum is 10, similarly a maximum NA score a subject could obtain is 50 and minimum is 10.

The Social Desirability (SD) score was obtained using the scoring key of the Marlowe-Crowne Social Desirability Scale and a score of 17 and below indicates that the subject was genuine in his responses while a score above 17 indicates that the subject is inclined to under-report undesirable traits with high need for approval.

Data of the nine variables for fifty subjects were entered into the Statistical Package for Social Sciences (SPSS) 10.0.1 on the computer for analysis. The descriptive statistics were drawn for the group on all these variables and further Pearson's Product Moment Correlations were drawn to see the association between the personality and PWB dimensions.

**Results**

The descriptive statistics of the group on personality variables, PWB as well as Social Desirability are as shown in Table 5.

The descriptive data showed that in general the

**Table 5: Descriptive Statistics of the group on personality, PWB and Social Desirability variables (N=50)**

Variable	Min	Max	Mean (S.D)
Neuroticism	0.00	45.00	37.86(7.57)
Extraversion	17.00	44.00	30.22(6.02)
Openness	13.00	38.00	26.44(5.27)
Agreeableness	21.00	42.00	30.70(5.03)
Conscientiousness	24.00	48.00	35.58(6.01)
SWLS	8.00	34.00	22.22(6.16)
PWB	9.00	25.00	16.72(3.73)
PA	20.00	47.00	34.32(6.35)
NA	10.00	33.00	16.66(5.08)
SD	14.00	28.00	20.04(3.68)

aviators were in the average range profile of the adult population norms on the variables of personality, SWLS and PWB, except that the group seemed to be high on neuroticism and very high on extraversion and relatively low on agreeableness and conscientiousness domains of personality. The group displayed a high PA score and low NA score.

On Social Desirability, results indicate that the numbers of respondents scoring 17 or below were 28% of the sample and the respondents scoring above 17 are 72% of the sample. The mean score reflects that the group have under reported undesirable traits and had high need for approval.

The group correlations were carried out between the variables of personality and PWB. The results indicated that there was a significant negative correlation ( $r = -0.46$ ;  $p < 0.01$ ) between neuroticism and PWB (Fig 1) and a significant positive correlation ( $r = 0.48$ ;  $p < 0.01$ ) between extraversion and PWB (Fig 2). There was no significant correlation obtained between PWB and openness, agreeableness and conscientiousness dimensions of personality as well as between PWB and social desirability.

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The demographic variables like age, education, years of service, and flying hours did not reveal any significant correlation with personality variables. Other demographic characteristics such as aircraft types, marital status, presence of domestic/ occupational stress and accidents or incidents did not reveal significant differences between groups. Only agreeableness domain of personality showed significant differences with respect to different military ranks as shown in Table 7. It is observed that the highest mean values were seen in Sqn Ldrs and Fit Lts. Wg Cdrs were lower and Fg Offrs were the lowest on agreeableness.

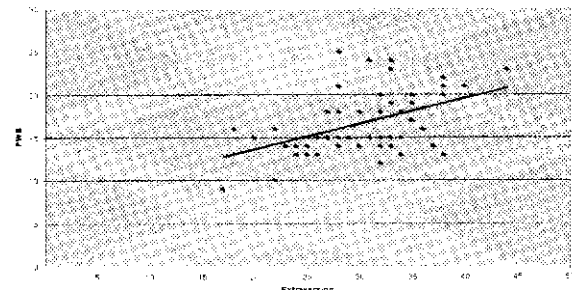
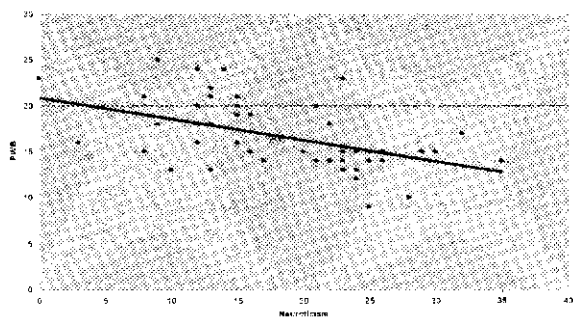
The demographic variables like age, education, years of service, and flying hours did not reveal any significant correlation with dimensions of PWB. Other demographic characteristics such as military rank, marital status, presence of domestic/ occupational stress and accidents or incidents did not reveal significant differences between groups. Only

the PWB variable showed significant difference with respect to aircrew who fly different aircraft types as shown in Table 8. It is observed that the highest mean value on PWB was seen in helicopter pilots followed by fighter pilots and the least in the transport pilots.

Correlations were also drawn between the social desirability scores and the personality constructs as well as social desirability and PWB and its dimensions viz. SWLS, PA and NA. Results reflect that there is no significant correlation between Social desirability and neuroticism and

**Table 6: Correlation values between Personality and PWB in military aircrew**

Personality/ PWB	SWLS	PWB	PA	NA
Neuroticism	-0.61**	-0.46**	-0.46**	0.45**
Extraversion	0.42**	0.48**	0.51**	-0.24
Openness	0.08	0.63	0.26	0.85
Agreeableness	0.41**	0.28	0.05	-0.30*



Conscientiousness	0.01	0.17	0.50**	-0.28*
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\*\*p<0.01 ; \*p<0.05

**Fig 1: Correlation between PWB and neuroticism**

**Fig 2: Correlation between PWB and extraversion**

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**7: Significant differences on agreeableness scores among different ranks of military aircrew**

Measure	FgOffr (Group 1) (N=5)		Fit Lt (Group 2) (N=10)		Sq n Ldr (Group 3) (N=18)		Wg Cdr (Group 4) (N=17)		Analysis	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	F (df=3,46)	Post Hoc Comparisons'''
<b>Agreeableness</b>	27.60	3.91	32.22	3.75	32.77	4.67	28.70	5.46	3.07*	3>4.1

<sup>A</sup> LSD Post Hoc Test  
(p<0.05) \*p<0.05

between Social Desirability and openness. A significant positive correlation is obtained between Social Desirability and extraversion ( $r = 0.28$ ;  $p < 0.05$ ) and Social Desirability and agreeableness ( $r = 0.37$ ;  $p < 0.01$ ) as well as conscientiousness ( $r = 0.39$ ;  $p < 0.01$ ). There is no significant correlation obtained between Social Desirability and PWB and also between Social Desirability and NA. However between Social Desirability and SWLS ( $r = 0.29$ ;  $p < 0.05$ ) and between Social Desirability and PA ( $r = 0.52$ ;  $p < 0.01$ ) positive correlations were identified.

**Discussion**

The descriptive scores on the dimensions of personality indicate that pilots have high levels of neuroticism which means that they manifest tendencies to experience unpleasant emotions easily, such as anger, anxiety, depression, or vulnerability and can sometimes be emotionally unstable. This is in line with a study at IAM [19], which reported that Indian

military pilots have high levels of neuroticism due to defence oriented coping. However this is contrary to the research done in the west on aircrew which indicated that the pilots were significantly less neurotic on Eysenck's Personality Inventory, than the general population [20]. The high level of neuroticism in Indian aviators as compared to their western counterparts needs further investigation to ascertain which predominant facet contributes to neuroticism. This aspect is of concern as high neuroticism may serve as a predisposing factor to psychopathology among Indian pilots.

The results also describe pilots to be relatively low on agreeableness and conscientiousness. This is in accordance with the findings of a previous study [19], which found Indian pilots to be low on conscientiousness, an aspect of achievement that seems to be lower in Indian culture. Research in

**Table 8: Significant differences on PWB scores in military aircrew flying different aircraft types**

Measure	Fighter (Group 1) (N=27)		Transport (Group 2) (N=3)		Helicopter (Group 3) (N=20)		Analysis	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	F(df=2,47)	Post Hoc Comparisons'''
<b>PWB</b>	15.92	2.46	12.66	2.51	18.40	4.52	5.158**	3>1,2

<sup>A</sup> LSD Post Hoc Test (p<0.05),

USA that employed Edwards Personal Preference Schedule (EPPS) also stated that the pilots are below average in order (plan and neatness) [21].

In the sample, 16% scored between 0-13 on PWB which indicate poor quality of life and 84% have scored in the range of 14-25 which represent average to best possible quality of life. The group means on SWLS and PWB are 22.2 and 16.7 which signifies that the pilots perceive themselves to have average quality of life and in general have moderately adjusted to the society and to certain extent are free from psychopathology. This is not similar to studies elsewhere [4], which state that USAF fliers have uniformly better PWB than the comparably aged general people. The USAF fliers have higher PWB than the aviators in this current sample. The high mean score on PA reflects that the pilots have high positive affect with full concentration toward the activities they engage themselves in. This has many good outcomes like better health, less inter personal problems and lead happier lives. Accordingly a high positive affect would lead to greater productivity and more responsible behavior at work [22]. The low mean score on NA reflects less level of aversive mood states and distress among the subjects.

The negative correlation between PWB and neuroticism and a significant positive correlation between PWB and extraversion are in accordance with an earlier study [8]. This could be interpreted to the work and life style of the pilots, who are high on sociability, high spirited and active coupled with high positive affect. This is also in line with the personality studies [23] done on pilots using MMPI, which found pilots to be relatively high in sociability and un-anxious. The correlation between PWB and PA and between PWB and NA bring to light that subjects experiencing frequent positive affect and infrequent

negative affect make favorable judgments of their overall life satisfaction and well-being.

Demographic characteristics were analyzed to identify the differences between various groups with respect to personality and PWB. As stated in the results most of these analyses yielded nonsignificant results. There was a significant difference observed between the different military ranks on agreeableness domain of personality. The reason for the higher values of agreeableness in Sqn Ldrs and Fit Lts could be due to a positive adaptation to the service conditions in mid-career as compared to Fg Offrs who are new to the service. Wg Cdrs showed a lower level of agreeableness which could be due to the lack of role requirement of this trait at their seniority level which encourages more of an authoritarian style of working.

Only the PWB variable showed significant difference with respect to aircrew who flew different aircraft types. It is observed that the highest mean value on PWB was seen in helicopter pilots as compared to fighter and transport pilots. One reason for this could be higher level of extraversion, openness and conscientiousness and lower level of neuroticism personality domains among helicopter pilots, found in this study. Added to this could be the involvement of helicopter pilots in their work while being exposed to realistic situations continuously during peace time such as relief operations and casualty evacuations. In comparison fighter pilots only get to work in realistic situations during war times or simulated war games. Therefore helicopter pilots may find their work more helpful to others, purposeful and more meaningful, leading to an enhanced PWB. Thus it can be speculated that differences between fighter and helicopter pilots on PWB could be due to both personality and environmental factors. However this aspect needs further investigation.



Results indicate that the group is inclined to give socially desirable responses i.e. to underreport undesirable traits and possess a high need for approval which is in accordance with the previous studies [24,25,26]. Positive correlation as indicated between extraversion and PWB may not be as high as it is portrayed since this dimension of personality is correlated positively with Social desirability. Similarly the group's mean value on SWLS and PA may not be this high as manifested since the correlation between Social Desirability and SWLS and Social desirability with PA is positive and significant. Therefore the interpretation of the group's perceptions on these variables was done considering the social desirability factor without over ruling the possible exaggerations made by the group self-disclosure. This is in line with earlier studies [27,28] which reported significant positive correlations between Marlowe-Crowne Scale and life satisfaction. These studies cite that persons scoring high on the Marlowe-Crowne Scale tend to over report socially desirable and under report socially undesirable information about themselves.

However, it is possible that subjects scoring high on the tests do behave in an altruistic manner consistent with the underlying personality traits represented by the measures. This interpretation has empirical support from previous studies [29-31]. Keeping in view the life style and the training of the subjects it may be inferred that the pilots have internalized the altruistic manner consistent with the personality traits and the job requirements. Needless to say, further studies are required using both self-report methods and personality rating to ascertain whether aircrew actually behave in this manner or not as there is not much of evidence on this aspect pertaining to the IAF pilots.

The findings of this study cannot be considered definitive, most obviously because of the small sample size and small sub sample sizes in different categories

such as marital status, rank and aircrew flying different aircraft. In addition, the full NEO-PIR was not employed, the possibility that the use of the abbreviated measure may have influenced the results cannot be ruled out. Acknowledging these limitations, it is important to note that our findings are based on a small representative sample on which self-reported data was collected.

### Conclusion

PWB is defined as a person's judgment or evaluation to his/her life; either in terms of life satisfaction (cognitive evaluations) or affect (emotional reactions), which is further divided into pleasant affect (positive feeling) and unpleasant affect (negative feeling). Negative perceptions and expectations of PWB are associated with decreased positive affect and with less adaptive and coping efforts, eroding feelings of mastery and hope in the fliers. This preliminary study aimed at identifying the general level of PWB of IAF pilots; and examined association between PWB and personality.

Results indicate that pilots perceive themselves to be positive and lead fulfilling lives with average PWB. They evaluate themselves to have average satisfaction with life and are driven by high positive affect. Correlation between personality domains and PWB showed a negative correlation between neuroticism and PWB which means that pilots who perceive themselves to have higher levels of PWB report lower levels of neuroticism. The positive correlation between PWB and extraversion indicate that pilots who perceive themselves to be out-going and sociable have higher levels of PWB. This tendency is likely to help aviators to cope with occupational stressors and maintain high standards of work performance. These results differ from previous western studies on aircrew indicating a possible cultural difference.

This study represents one of the few attempts to characterize the PWB of IAF pilots and set the note for positive psychology.

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