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Personality Traits, Machiavellianism Intelligence, Irrational Beliefs among Chronically Ill Older People and COVID-19 Outbreak

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Abstract: Irrational belief is a product of complex personality traits and Machiavellianism Intelligence. The present study is conducted to trace the significance of predictive nature of personality characteristics and Machiavellianism Intelligence (Mach Intelligence) on irrational beliefs among chronically ill older people. The research method is cross-sectional with correlational design, purposive sampling with a total of 200 chronically ill older people aged between 40–60 years with disease type such as Systemic lupus erythematosus, Complicated Diabetes, Glomerulonephritis and Chronic Heart Failure. The analysis revealed that personality characteristics and irrational belief subscales such as worrying, rigidity, problem avoidance and Mach Intelligence are significantly positively correlated; however, Emotional irresponsibility has significant negative correlation with personality characteristics and Mach Intelligence. Gender differences revealed that males are high on all the subscales of personality characteristics, irrational beliefs (except emotional irresponsibility) and Mach Intelligence as compared to female chronically ill older people. Predictive analysis also revealed that overall personality characteristics explained a total of 67% variance in irrational beliefs. Moreover, Mach Intelligence predicts irrational beliefs. Future health related recommendations should be planned accordingly.

Keywords: personality characteristics; Machiavellian intelligence; irrational belief; chronically ill older people; systemic lupus erythematosus; complicated diabetes; glomerulonephritis and chronic heart failure; Covid-19

1. Introduction

The present study explored the predictive effect of personality characteristics and Machiavellianism Intelligence on irrational beliefs among Chronically ill older people with various disease types after Covid 19. Personality characteristics are important features of personality that determine the behavior to some extent and are trends or attitudes that are displayed irrespective of the situation. Personality is underlined by five major traits e.g., openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism.

The aim of the research was to better understand the personality trends over the continuum including the darker traits of a personality and its link with the irrational beliefs among the chronically ill older people. Although in a particular culture the Machiavellianism intelligence had a downward trend towards the age of 65 however upward trend from childhood to adolescence [1]. Machiavellian Intelligence characteristics are tendencies are specific in terms of social and cognitive skills of being deceitful in interpersonal relations, a skeptical indifference for moral values and

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focused on self-serving and personal regards. As lower the Mach Intelligence, lesser will be the change in behavior [2].

Irrational beliefs are considerable cognitions which are unreasonable conflicting with reality and accustom people to look for transient interests rather than striving for long term objectives. According to Cognitive behavioral model emotional stability is highly impacted by beliefs of people. Depression, anxiety aggression and self- defeating behaviors are led by irrational beliefs. Irrational belief causes unhealthy responses towards negative events [3,4].

Chronic illness critically affects the physical and psychological health of older people specifically mobility and emotional balance due to complete or partial dependency on others. The concept of Self gets under threat and dissonance becomes high effecting the cognitive belief system [5,6].

According to an Initial research, Machiavellian personality types exhibit domineering, exploitative, and unsympathetic behaviors. A positive relationship link has also been reported between narcissism and characteristics which are underlining Machiavellianism. Similarly, the relationship between the dark triad (e.g.,) personality characteristics and impulsivity. Findings showed that there is no uniform relation between Machiavellianism and impulsivity. As the individual with Machiavellianism employ more thoughtful and considerable patterns in dealing with life situation as compared to impulsive participants. On the contrary there exists a consistent and reasonable pattern of association between the other triad and impulsivity [7–9].

The mediating role of irrational beliefs between emotional problems and personality dimensions showed that the irrational beliefs do have a notable mediating role between neuroticism and anxiety and between the former and depression. The study emphasized the significance functionally connecting emotional problems and personality characteristics [10].

The relationship between personality characteristics and irrational beliefs displays the role of personality characteristics as predictors for irrationality among the Chronically ill older people. Results revealed a positive association between neuroticism and irrational beliefs while a negative relation between irrationality and agreeableness and conscientiousness. Moreover, high score on neuroticism and introversion is associated with anxiety and low score on conscientious lead to MDD [11–13].

Furthermore, the relationship between irrational beliefs and self-confidence indicated an inverse relation between the two variables. Demographical variables also had a statistically remarkable impact on the confidence level and acceptance of irrational beliefs as a partial mediator between event of stressor and level of stressor. However, the emotional core of Machiavellian personality using multi-dimensional approach states it to have negative correlation between Machiavellianism and empathy and positive correlation with depression and anxiety [14,15].

The experimental evidence for causal link between irrational beliefs and unconditional self-acceptance highlighted significant suggestions for the REBT hypothesis and preferred the experimental theory testing over correlation one, and, found in cross-cultural research a noticeable link between big five personality characteristics and behavioral outcomes [2].

Evidence on personality differences between orphans and non-orphans' older adults found remarkable difference in the malevolence and world view among orphanage and non-orphanage older individuals and non-orphans while other constructs have no differences among the three groups.

Although, personality factors found to have a strong relation with irrational beliefs in different population but only few of research have given considerable attention to highlight the influence of Machiavellianism Intelligence in development of irrational beliefs among chronically ill older people. Moreover, no other research has been conducted which have utilized the present study instruments on older population. The current work is aimed to explore the predictive effect of personality characteristics, Machiavellianism characteristics on irrational beliefs among chronically ill older people.

Personality characteristics have been extensively used by most of the personality theorists to study the human psyche. Openness refers to how open or reluctant someone is to experience. Conscientiousness is the personality trait of being thorough, careful, or vigilant. Extraversion

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describes how social a person is. Agreeableness is related to the person's ability to be compromising and reliable. Neuroticism deals with anxiety, moodiness, worry and the degree of being self-confident and self-contended. Machiavelli (1469–1527) was an Italian politician who used this term for manipulative and deceitful behaviors [16]. Later Christie and Geis (1960), social psychologists finalized the trait of Machiavellianism as a prominent personality trait that is common among many individuals [17]. They devised the most popular scale MACH IV test in 1970 that has been extensively used in this field. Albert Ellis introduced the term irrational beliefs and operated as a dysfunctional and inconsistent while the rational beliefs are logical and in consistence with reality [18].

Asian researchers have majorly focused on the role of Machiavellianism Intelligence as a mediator. These variables have been studied in regard to demographical variables. Personality characteristics have been studied with irrational beliefs but not Machiavellianism. Though personality characteristics and irrational beliefs have been studied substantially but not in the current population [19].

The current study will add on a fair piece of evidence into the existing literature on personalities traits, Mach Intelligence and irrational beliefs among chronically ill older people. The findings of the research will be set a ground for cognitive health-related programs to improve quality of life of chronically ill older people. This research has scope in the field of clinical psychology and will help expand the literature regarding the studied variables. The study will contribute to the local research literature in viewing the Machiavellians in terms of their beliefs and traits. It will set a pathway for future research in this regard in older people. The research can be a valuable source of evidence for new theories.

2. Materials and Methods

The current cross-sectional study comprised 200 chronically ill older people aged between 40–60 years. The patients with the following chronic illness type participated in the research.

Chronic Illness Type	n	Percentage
Systemic lupus erythematosus	50	25%
Complicated Diabetes	50	25%
Glomerulonephritis	50	25%
Chronic Heart Failure	50	25%

All the patients with an unidentified problem were excluded from the study. All the patients were from joint family system i.e., either they were living with their children, grandchildren, or siblings. All the patients were from middle socio-economic status. The data was collected from public hospitals only. All the participants had more than once admission to the hospital history.

2.1. Questionnaires

In the present study, following three instruments were used:

1. Big Five Inventory (BFI; Goldberg, 1993),
2. MACH-IV Test (MT; Christie and Geis, 1960), and
3. Irrational Belief Inventory (IBI; Koopmans, Sanderson, Timmerman, & Emmelkamp, 1994).

All the three instruments have established validity and reliability for the subject population.

2.1.1. Big Five Inventory (BFI; Goldberg, 1993)

The scale measured broadly five major categories of personality namely e.g., agreeableness, conscientiousness, neuroticism, openness and extraversion. It has 44 items (Goldberg, 1993). It is a five-point Likert scale having options like strongly disagree, disagree, neutral, agree strongly agree. Items 1, 6, 11, 16, 21, 26, 31 and 36 measure extraversions. Items 2, 7, 12R, 17, 22, 27, 32, 37 and 42 measure agreeableness. Conscientiousness is measured by items 3, 8, 13, 18, 23R, 28, 33, 38 and 43. Items 4, R, 14, 19, 24, 29, 34 and 39 measure neuroticisms. Openness is measured by items 5 10, 15, 20

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25, 30, 35, 40, 41 and 44. However, 2, 6, 8, 9, 12, 18, 23, 24, 27, 31, 34, 35, 37, 43 and 41 are reverse score items [20].

2.1.2. MACH-IV Test (MACH; Christie & Geis, 1960)

In the present study MACH-IV test was developed by Christie and Geis in 1960s for measuring person's level of Machiavellianism Intelligence. The scale consists of a twenty-statement personality survey that is now the standard self-assessment tool of Machiavellianism. People scoring above 60 out of 100 on the MACH-IV are considered high Mach's [21].

2.1.3. Irrational Belief Inventory (IBI; Koopmans et al., 1994)

Koopmans et al. (1994) developed this inventory. The scale is a five-point Likert scale and has 50 items. The options for responses are *strongly disagree, disagree, neutral, agree strongly agree.* The scale has five subscales. Worrying is measured by the items 1, 2, 6, 7, 8,10,16,19,22,26,28 and 32. Whereas 3,4,9,14,18,20,24,29,33,34,35,38,39 and 41 measure rigidity. Problem avoidance is measured by 11, 13, 25,27,31,36,40,44,45 and 47.Items5, 21, 23,37,43,48 and 50 measure demand for approval. However, emotional irresponsibility is computed by items 12, 15, 17, 30, 42, 46 and 49. Item number 1, 8, 10, 12, 15, 17, 26, 27, 30, 42, 46, 48 and 49 are reverse score items [22].

2.2. Procedure

Participants were reached following the appropriate ethical guidelines with permission from the hospital Management team. The voluntary participation was ensured. Data was gradually collected in different phases depending on the availability of Chronically ill older people, side by side the subjects were provided necessary information as per their requirement to satisfy their queries. Ethical principles were held in mind while the data collection and all the participants were thoroughly assured of their confidentiality and anonymity. The subjects were allowed to leave the research if they feel unsafe.

2.3. Statistical Analysis

In the current quantitative study, the data was analyzed using IBM SPSS 23.0.1. 0 version for Windows.

Correlation matrix was applied to measure the correlation between the variables; *t*-test was applied to measure the gender differences; and multiple regression analysis were performed to find the predictive effect of independent variables by controlling one at a time.

3. Results

Table 1. Pearson Correlation among all the Variables of study.

		1	2	3	4	5	6	7	8	9	10	11
1.	Extraversion	-	.46**	.50**	.27**	.32**	.59**	.45**	.57**	.12	-.28**	.46**
2.	Agre		-	.34**	.35**	.29**	.54**	.38**	.52**	.17*	-.20**	.38**
3.	Conscien			-	.33**	.16*	.42**	.50**	.49**	.11	-.36**	.40**
4.	Neuroticism				-	.26**	.27**	.56**	.38**	.18**	-.23**	.45**
5.	Openness					-	.34**	.47**	.44**	.28**	-.03	.34**
6.	Worrying						-	.39**	.41**	.05	-.29**	.35**
7.	Rigidity							-	.49**	.30**	-.50**	.59**
8.	Prob. Avo								-	.25**	-.30**	.46**
9.	Demd.app									-	-.17**	.33**
10.	Emotio.irr										-	-.48**
11.	Mach. Intell											-

Note. Agre = Agreeableness, Conscien = Conscientiousness, Prob. Avo. Avoidance, Demd.app = demand for approval, Emotio.irr = emotional irresponsibility, Mach. Intell = Mach Intelligence. * $p < 0.05$, ** $p < 0.01$.

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Table 1 shows the relationship between personality characteristics, Mach Intelligence, and irrational beliefs. The personality characteristics, worrying, rigidity, problem avoidance and Mach Intelligence have significant positive correlation with each other. However, emotional irresponsibility has significant negative correlation with personality characteristics and Mach Intelligence.

Table 2. Mean, S.D, *t* among male female Chronically ill older people (N = 200).

Variables	Male (*n* = 100)		Female (*n* = 100)		t	P	95% CI		Cohen's d	
	M	SD	M	SD			LL	UL		
Extraversion	25.79	3.99	25.78	3.74	0.02	0.00	0.98	1.0	1.08	0.00
Agreeableness	30.91	4.18	29.10	4.03	3.11	0.32	0.58	0.66	2.95	0.44
Conscientiousness	29.19	3.67	28.68	3.69	0.98	0.07	0.31	-0.51	1.53	0.13
Neuroticism	25.88	3.57	24.97	3.66	0.78	0.74	0.03	-0.09	1.91	0.25
Openness	33.00	3.58	32.85	2.96	0.32	0.69	0.00	-0.76	1.06	0.04
Worrying	35.99	4.10	35.76	4.28	0.38	0.35	0.53	-0.93	1.39	0.05
Rigidity	46.84	5.42	46.08	6.08	0.93	0.52	0.01	-0.84	2.36	0.13
Problem avoidance	32.77	3.73	32.41	4.31	0.63	0.14	0.50	-0.76	1.48	0.08
Emotional Irr.	18.32	3.60	18.67	4.02	-0.6	0.51	0.12	-0.26	1.76	0.09
DFA	22.35	3.52	21.60	3.75	1.5	0.51	0.02	-1.4	0.71	0.20
Mach Intelligence	67.42	7.33	66.64	9.44	0.65	0.00	0.62	-1.5	3.13	0.09

CI = Confidence Interval, LL = Lower Limit, UP = Upper Limit, DFA= Demand for Approval, Irr. = irresponsibility.

Table 2 shows the mean score differences between both the gender. The mean score of males is higher in all the subscales of personality and irrational belief and Mach. Intelligence except in emotional irresponsibility. Among all the insignificant outputs Mach intelligence and extroversion is significant between both the gender with males scoring high than females.

Table 3. Testing effects of personality characteristics on irrational beliefs (N = 200).

Variables	Irrational Beliefs	
	B	Model 1
		95% CI
Constant	46.34	[35.07,57.67]
Extraversion	0.73 ***	[0.43,1.03]
Agreeableness	0.45 **	[0.19 ,0.71]
Conscientiousness	0.51 ***	[0.21,0.80]
Neuroticism	0.68 ***	[0.40,0.96]
Conscientiousness	1.34 ***	[1.40,1.64]
R^2	0.67	
F	80.10	

CI = confidence interval. * p < 0.05, *** p < 0.001.

Multiple regression analysis was carried out to investigate the predictive effect of personality characteristics, Mach Intelligence on outcome variable irrational beliefs e.g., worrying, rigidity, problem avoidance, demand approval and emotional irresponsibility.

Table 3 of Multiple regression analysis showed extraversion ($\beta = 0.25$, $p < 0.001$, agreeableness ($\beta = 0.17$, $p < 0.01$), contentiousness ($\beta = 0.16$, $p < 0.01$), neuroticism ($\beta = 0.22$, $p < 0.001$), and openness ($\beta = 0.39$, $p < 0.001$), positively predicted the irrational beliefs in the Chronically ill older people. The value of R^2 explained a total of 67 % variance in irrational beliefs. The above stated prediction is significant as ($F = 2.34$ and $p < 0.05$).

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Table 4. Testing effects of Mach Intelligence on irrational beliefs (N = 200).

Variables	Irrational Beliefs	
	B	Model 1
		95% CI
Constant	106.41	[95.82, 117.00]
Mach Intelligence	0.73 ***	[0.57, 0.88]
R^2	0.29	
F	84.48	

CI = confidence interval. * p < 0.05, ** p < 0.01.

The results in Table 4, of multiple regression analysis were carried to explore the predictive features of Mach Intelligence on irrational belief. As shown by the table the Mach Intelligence (β = 0.54, p < 0.001), positively predicted the irrational beliefs among Chronically ill older people. The value of R^2 explained 29% of variance on irrational beliefs. This prediction is significant as (F = 18.236 and p < 0.01).

4. Discussion

The aim of the present study was to investigate the link between Personality traits, Machiavellianism Intelligence, and Irrational beliefs among chronically ill older adults. Personality traits have a direct relation with mental disorders, and based on this evidence the current study is designed. Chronically ill older people are very challenging to manage until the medical staff are aware of their personality trait and accordingly in support of the treatment. [23]

The results indicate that there is a significant positive relationship between personality characteristics e.g., neuroticism, extraversion, agreeableness, contentiousness, openness and irrational beliefs e.g., (worrying, rigidity, problem avoidance, demand for approval). However emotional irresponsibility has a negative relationship with personality characteristics e.g., neuroticism, extraversion, agreeableness, contentiousness, openness. As individual personality characteristics determine different patterns of irrational beliefs in Chronically ill older people such Chronically ill older people will remain worrisome, have inflexible attitude towards life issues. Along with that the Chronically ill older people adopt more defensive patterns of dealing with life issues and due to inflexible attitude have rigid manner for demanding the approval of the impossible achievements. Similarly, some personality characteristics such as high contentiousness is linked with higher rigidity and demand for approval as the Chronically ill older people have personal ethical goals and demand the reality facing is difficulty and somehow, they utilize more irrational beliefs leading to jumping to conclusion. Similarly, the chronically ill older people with extroversion, neuroticism, agreeableness and openness deal with fluctuation in irrational belief but as the personality characteristics are the determinant of the personal thought patterns and life dealing method such Chronically ill older people utilize diverse methods of irrational beliefs [17,24].

The correlation analysis displays characteristics e.g., neuroticism, extraversion, agreeableness, contentiousness, openness had negative relation with the emotional irresponsibility. As each personality dimensions deal with different cognitive mechanism such as rigidity, avoidance but careless attitude has negative relation with personality dimensions of agreeableness, contentiousness, openness, and extraversion as these personality characteristics focus of appropriate attitude for life demands, solution, open to new ideas for life problems and deal with life frustrating situations with cherished manner of handling. The earlier evidence also shows the same patterns of positive relationship between characteristics and irrational beliefs [25,26].

The results in Table 1 highlighted that Mach Intelligence had positive relation with irrational beliefs e.g., (worrying, rigidity, problem avoidance, demand of approval). However, emotional irresponsibility had negative relation with Mach Intelligence. Chronically ill older people with Mach Intelligence have diverse manipulative patterns of thinking for achieving the personal gains so

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individual probability of being rigid for personal goals, worrisome thoughts for the goal attainment and mechanism for the goal attainment can be different with person with high Mach Intelligence. These Chronically ill older people adopt more irrational dealing methods as they have more irrational beliefs and cunning mechanism for life goals. Similarly, those Chronically ill older people with Mach Intelligence had negative relation with emotional irresponsibility as Chronically ill older people with emotional irresponsibility have less desired goals so the less careless attitude can make Chronically ill older people are less manipulative in achievement of life goals [27,28].

Further analysis revealed gender differences showing that males are overall higher on personality characteristics, Mach Intelligence and however no gender differences emerged on variable of irrational beliefs dimensions. As male chronically ill older people report more utilization of personality characteristics (may be due to infodemic) that empower them to deal with life vicissitudes as compared to female participants. The result showed that Mach Intelligence are more prominent in males as compared to females as males work out in social setting with different goals of life and utilize more Mach Intelligence to attain life goals by manipulating peoples. Whereas the manipulative techniques of the women differ in manner of goals as the manipulation tactics may be different for females. Differences in males and females' perception of Machiavellianism were also observed in an earlier study [29–31].

Multiple regression analysis in Table 3 revealed that personality traits such as extraversion (β = 0.25, $p < 0.001$, agreeableness (β = 0.17, $p< .01$), contentiousness (β = 0.16, $p < 0.01$), neuroticism (β = 0.22, $p < 0.001$), and openness (β = .39, $p < 0.001$), explained 67 % variance in irrational beliefs. As individual personality characteristics are major determinant of individual perceptional view of life and life demands. Similarly, neuroticism, extraversion agreeableness could predict more irrational belief such as worrying related to neuroticism, extroversion will adopt more irrational belief of avoidance as they indulge in more social behavior to avoid distressful thoughts [32].

Moreover, regression analysis revealed that Mach Intelligence (β = .54, $p< .001$) explained 29% variance in irrational beliefs. As the Mach Intelligence focus on self-promotion, disloyalty, aggressiveness, cold and manipulative strategies employed by person to deal in social world and thus basic factor behind individual increasing individual irrational beliefs. As previous research has also associated the Machiavellianism characteristics with psychopathology, it was more prominent in individual with narcissism. However, the findings of the study are in accordance to previous literature and suggest the need to conduct research on disease severity, disease type and personality traits [33,34].

5. Conclusions

Personality traits have a strong connection with Machiavellianism Intelligence, and irrational beliefs among the chronically ill older adults. The males scored higher on Machiavellianism intelligence and will have more irrational belief system. Therefore, management should be separately planned for such chronically ill older people due to their different needs. Moreover, the health professionals should take a heads up to carefully design interventions to address the shortcomings of the health system to deal the chronically ill older people.

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Informed Consent Statement: Informed consent was taken from all the participants.

Data Availability Statement: The data is available from the author upon request. The data is not published due to privacy concerns of the chronically ill older people.

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