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The mental health of family caregivers: do the complementary roles of personality trait, social support, and resilience matter?

Abstract

Background: Caregivers form an integral informal workforce that is usually overlooked, undervalued, and faces challenges such as maintaining optimal well-being and caring roles. This present study investigated the roles of personality, social support, and resilience in the mental health of family caregivers.

Participants and methods: The study based on self-report measures of the Big Five Personality Inventory, Social Support Scale, Resilience Scale, and General Health Questionnaire adopted a descriptive cross-sectional design. The participants in the study were 250 caregivers. Hierarchical multiple regression was used for data analysis.

Results: Results showed that the dimensions of the big five personality traits neuroticism ($\beta = -0.15$, $p < 0.05$), extraversion ($\beta = 0.16$, $p < 0.05$), openness to experience ($\beta = 0.17$, $p < 0.05$), conscientiousness ($\beta = 0.15$, $p < 0.05$) and agreeableness ($\beta = 0.13$, $p < 0.05$) significantly associated with family caregivers' mental health. In addition, social support ($\beta = 0.13$, $p < 0.05$) and resilience ($\beta = 0.13$, $p < 0.05$) were positively associated with the mental health of caregivers.

Conclusions: Families, providers of health care, hospital management, and policymakers in the health care sector should take cognizance of these endogenous and exogenous factors (*e.g.*, social support, personality traits, and resilience) in the development of intervention and support services for both existing and potential health caregivers. This is pertinent since their mental health is dependent on the positive correlation among these variables of interest.

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Keywords: personality traits, social support, resilience, family caregivers

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Introduction

Caregivers are becoming increasingly common as populations age in various regions of the world and ailments increase, with less attention given to such needs [1]. This is because caregivers form an integral part of the healthcare system in the informal workforce [2]. The concept of caregiving revolves around providing support, assistance, and care to individuals who are unable to fully care for themselves due to various reasons such as age, illness, disability, or other challenges [3]. Caregiving encompasses a wide range of activities and responsibilities, and it is often driven by a sense of responsibility, compassion, and empathy for those in need [4]. Caregiving refers to any sort of direct care, including labor done by paid and unpaid workers such as nurses, social workers, family members, significant others, and counselors [5]. Caregivers are individuals who provide various forms of support, assistance and care to people who are unable to fully care for themselves due to age, illness, disability, or other challenges. Caregiving can encompass a wide range of tasks and responsibilities, and caregivers can be family members, friends, or hired professionals. However, the emphasis in the present study is on family caregivers rather than professional caregivers. Family caregivers provide direct unpaid care to their family members because they are emotionally invested in the act of caregiving obligation as a result of the bond they share with the significant person [6]. Corollary, family caregivers perform a variety of tasks such as personal care, medical care, emotional support, household management, mobility assistance, and advocacy depending on the needs of the person they are rendering caring for [7]. In essence, family caregiving embodies the idea of offering help and support to family individuals who require assistance due to their unique circumstances [8]. It is a fundamental aspect of human compassion and interconnectedness, aiming to improve the well-being and dignity of family members who need care. Thus, family caregivers play an indispensable role in society, offering crucial support to those in need. Interestingly, the rapid increase in caring obligation has made informal caregivers critical stakeholders in the sustainability of social protection, healthcare, and the well-being of the care recipients [9]. This is pertinent because informal caregivers (family members), play a vital and distinctive role in providing care assistance.

Invariably, there is an urgent quest for studies on family caregiving among developing nations. For instance, in Nigeria, more than two-thirds of the population provides solicited and unpaid support to their sick ones [6], which shows that informal caregivers need support. Family caregivers are overlooked and undervalued in Nigeria due to the notion that it is culturally assumed that the family would care for their sick ones [6, 10]. This is pertinent because Nigerian culture has characteristics that are akin to influence caregiving and its attendant consequences. For instance, most of the tribes in Nigeria have norms or values that family members should provide unpaid caregiving common to their family members who are in need [11]. This is in contrast to what is obtained in Western societies, where caregivers have a right to "have a life" and are honored for their work [12]. In addition, family caregivers in Nigeria experience difficult role demands due to the huge stress related to caregiving because of a lack of infrastructure, manpower, unsupportive government policies, and limited resources [13]. This leads to poor mental health, depression, and anxiety caused by limited resources, lack of governmental support, and the individualistic nature of the Nigerian society, where every household takes care of its concerns [14]. Thus, to maintain optimal mental health among family caregivers, they must synchronize their caring obligations with their work, resources, physical and emotional health, and overall quality of life [15]. This is pertinent because effective service delivery among family caregivers is dependent on their mental health.

Furthermore, mental health plays a significant and interconnected role in caregiving, both for the care recipients and the family caregivers [16]. Mental health refers to a person's emotional, psychological, and social well-being [17]. It encompasses various aspects of an individual's life, including their thoughts, feelings, behaviors, and the quality of their relationships. Mental health is a crucial component of overall health and can significantly affect a person's ability to lead a fulfilling and productive life. Its multifaceted nature encompasses the emotional, psychological, and social well-being of an individual, which is essential for overall health and quality of life. Thus, the challenges and demands of caregiving such as caregivers' mental health (*e.g.*, emotional well-being, cognitive impairment, isolation and loneliness, stress and burnout, depression and anxiety, social isolation, guilt and self-neglect can affect the mental well-being of both the caregiver and care recipients [18]. However, raising awareness about the mental health challenges family caregivers face is critical because they are the key stakeholders in the healthcare journey of caring obligation [19]. This is pertinent because caregivers deserve recognition, understanding, and comprehensive support as they navigate the intricate balance between caregiving and mental health [20]. Nonetheless, there is a dearth of research in the body of literature that may be used

to drive evidence-based planning for understanding the psychological, social, and personal elements that influence the mental health of family caregivers, especially in a neglected context like sub-Saharan Africa (*e.g.*, Nigeria).

Studies [17, 20] have shown the precipitating factors that influence and contribute to caregivers' mental health. However, these prior studies [*e.g.*, 13, 17, 20] have shown the correlation between social support and mental health, resilience and mental health, and personality and mental health, all in isolated situations and contexts with regard to Western culture and societies, with greater emphasis on professional caregivers rather than family caregivers [5, 17]. However, the roles of personality traits (big five), social support, and resilience in influencing the mental health of family caregivers remain understudied, especially in a neglected context like Sub-Saharan Africa (*e.g.*, Nigeria). Thus, the current research aimed to examine the unique complimentary roles and contributions of personality traits (big five), social support, and resilience in fostering mental health among family caregivers in this neglected context. To achieve this, the present study answers the calls of previous researchers [4, 9] on the need for cross-cultural validation and transportation of findings to diverse contexts. Based on this premise, the researchers examined the relationships between resilience, social support, and personality traits on the mental health of family caregivers with particular emphasis on the neglected context of sub-Saharan Africa, using Nigeria as a reference point.

Literature review

Personality trait and mental health

Personality and mental health are closely intertwined, with certain personality traits influencing an individual's susceptibility to mental health challenges and their ability to cope with stressors [21]. Personality refers to enduring patterns of thoughts, emotions, and behaviors that shape how an individual perceives and interacts with the world [22]. These traits remain relatively consistent over time and across various situations, shaping an individual's behavior, reactions, and preferences. Furthermore, the interaction between personality traits and mental health can be complex and dynamic, whilst certain traits may predispose individuals to specific mental health vulnerabilities, they can also be leveraged as strengths to promote well-being [23]. Understanding these connections can aid in early intervention, personalized treatment, and the development of coping strategies tailored to an individual's personality profile. Thus, certain personality traits can affect how family caregivers perceive and respond to their caregiving responsibilities, which may have a subsequent impact on their mental health. These personality traits include; neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness [24]. Neuroticism refers to the tendency to experience negative emotions such as anxiety, depression, and mood swings). Individuals high in neuroticism are more likely to be sensitive to stressors and experience emotional instability leading to poor mental health. Extraversion on its part encompasses qualities like sociability, assertiveness, and positive emotions [25]. Extraverted individuals tend to be outgoing, energetic, and enthusiastic in social situations. Extant studies [*e.g.*, 26] have evidenced that extraversion can act as a protective factor against certain mental health issues because of their larger social networks, which can provide emotional support and buffering against stress. Openness to experience refers to an individual's inclination toward creativity, curiosity, and appreciation for new experiences [27]. People high in openness are imaginative, open-minded, and receptive to unconventional ideas. Whilst openness itself is not directly linked to mental health, individuals high in this trait may be more open to seeking and engaging in human interaction. Agreeableness involves characteristics like kindness, empathy, and cooperation. Those high in agreeableness are considerate of others' feelings and tend to avoid conflict [28, 29]. Even though agreeableness generally contributes to positive social interactions, extremely high levels may lead to difficulties in asserting personal boundaries, potentially affecting mental well-being. The fifth trait, which is Conscientiousness, encompasses traits like organization, self-discipline, and goal-oriented behavior. Thus, conscientious individuals are responsible, dependable, and focused, with better mental health outcomes. People high in conscientiousness tend to engage in healthy behaviors, adhere to treatment plans, and effectively manage stress. These traits may help family caregivers manage their caregiving roles efficiently and reduce the likelihood of feeling overwhelmed or burned out.

Social support and mental health

Another pertinent factor that affects family caregivers' mental health is the level of perceived social support they enjoy. Social support refers to the assistance, comfort, empathy, and resources provided by one's social network of friends, family, peers, and community members [30]. It encompasses various forms of emotional, instrumental (practical assistance, such as help with caregiving tasks or access to community resources, which can alleviate the burden on caregivers and positively impact their mental health)

informational (receiving guidance, advice, and information related to caregiving that can empower caregivers and reduce uncertainty), and companionship support that individuals receive during times of need or in daily life [31]. Family caregivers who have access to emotional support from family, friends, support groups, or healthcare professionals may experience reduced levels of stress, depression, and anxiety [32]. Furthermore, Shiba et al. [33] and Kort-Butler [34] asserted that social support from significant figures increases pro-active health-related behaviors among individuals. This is pertinent since human beings are inherently social creatures, and interactions with others have a profound impact on psychological, emotional, and even physical health. Extant studies have shown a strong link between close relationships, the quality of relationship experience, and mental well-being [35, 36]. Previous studies [30, 32] have suggested that social support contributes to a higher quality of life, meaningful connections, and interactions, which enrich daily experiences and provide a sense of purpose and fulfillment. Thus, seeking support from friends, family, and support groups is essential in reducing the vulnerability of family caregiver's mental health. This is pertinent because family caregivers with strong social support networks often experience lower levels of stress, depression, and anxiety. This is because the demands of providing care can affect caregivers' well-being. Thus, social support provides a safe space for family caregivers to express their emotions, receive validation, and gain emotional resilience through friends, family, and support groups; thereby improving family caregivers' mental health [35].

Resilience and mental health

Furthermore, to maintain optimal mental health among family caregivers, resilience should be construed among caregivers. Resilience is the psychological and emotional capacity to adapt, bounce back, and thrive in the face of adversity, challenges, and significant life stressors [37]. It is the ability to maintain mental and emotional well-being despite encountering difficult situations. Resilience involves a combination of personal traits, coping strategies, and external supports such as adaptability, positive mindset, problem-solving, self-efficacy, emotional regulation, and coping strategies that help individuals navigate and overcome setbacks and hardships [38]. Caregiving can be emotionally and physically demanding, leading to increased risks of mental health challenges for caregivers. Thus, resilience acts as a protective factor, enabling family caregivers to adapt, cope, and maintain their mental health in the face of these challenges. This is evidenced in Block and Block's [39] model of ego control and ego resilience theory, which suggests that integrating the recognized dynamics of healthy attachments such as permeability and elasticity, facilitates individual well-being. Thus, resilient individuals often possess characteristics such as optimism, problem-solving skills, flexibility, and the ability to seek support when needed [40]. Past studies [*e.g.*, 41] have demonstrated that a variety of factors, including individual variations (such as personal strengths), environmental elements (such as social support), and life experiences, can contribute to mental health. In other words, these elements increase people's capacity to adapt to and successfully handle difficulties in the face of adversity or stressful circumstances. Hence, in the demanding role of family caregiving, resilience acts as a buffer in reducing the risk of mental health issues such as depression, anxiety, and burnout.

However, the findings of the present study have vital implications for family caregivers and recipients of family caregiving since the study findings provide a vital framework and springboard into the inherent factors that influence and contribute to the mental health of family caregivers. Thus, the current study was guided by the following hypotheses:

- H1: Personality traits (extroversion, neuroticism, openness to experience, agreeableness, and conscientiousness) significantly associates with the mental health of family caregivers;
- H2: Social support is significantly associated with the mental health of family caregivers;
- H3: Resilience is significantly associated with the mental health of family caregivers.

Figure 1 gives a summative expression of the expected associations among personality traits, social support, and resilience on the mental health of family caregivers.

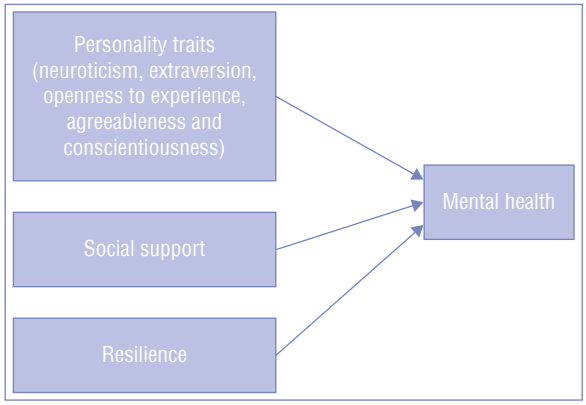

Figure 1. The hypothetical model of study the variables

Participants and methods

Study design

The present study was a descriptive cross-sectional design conducted in Nigeria in 2023. The STROBE guidelines for reporting observational studies were strictly followed.

Participants and setting

The participants for the study were 250 family caregivers comprising 147 (58.8%) males and 103 (41.2%) females drawn from different federal government-owned hospitals in Southeast Nigeria. The federal government owed hospitals were chosen because of their specialized nature and wider coverage in terms of infrastructure, staff, specialty, and human resources. The sample size was calculated with a 5% margin error, a 95% confidence interval, and an estimated sampling population of 405 both in and outpatients enlisted as patients in the hospital under study, with attendant family caregivers. The recommended minimum sample size using the Raosoft online sample calculator [42] was 198 participants. Thus, the sample size utilized in the study was above the threshold level. The age of the participants ranged from 18–60 years (mean age = 33.42; SD = 11.06). With respect to marital status, 108 (43.2%) were married, while 142 (56.8%) of the participants were single. For the participants' educational qualifications, the majority of the participants, 119 (47.6%) have WACE/GCE, 79 (31.6%) have degrees, and 52 (20.8%) have FSLC. The inclusion criteria include: both married and unmarried male and female family caregivers (age between 18–60 years); with at least primary education and must be a primary caregiver to a particular patient at the hospital or home and not just a person who visited the patient. Exclusion criteria include caregivers above 60 years, without any educational qualification, and not a primary caregiver to a particular patient.

Measures

Four instruments were used in the present study namely the Big Five Personality Inventory, Social Support Scale, Resilience Scale, and General Health Questionnaire.

Big Five-Personality Inventory

A 44-item Big Five Inventory developed by John and Srivastava [43] was used to assess the five-dimensional perspectives of personality — openness, conscientiousness, extroversion, agreeableness, and neuroticism. It was developed to represent a prototype definition of an observer's personality ratings to allow efficient and flexible assessment of the five personality dimensions. Sample items include; "someone who has an active imagination" (openness to experience), "someone who tends to be lazy" (conscientiousness), "I see myself as someone talkative" (extraversion), "someone who has a forgiving nature" (agreeableness), and "someone who can be moody" (neuroticism). Openness to experience has 10 items; conscientiousness — 9-items; extraversion — 8-items; agreeableness — 9-items and neuroticism — 8-items. The response format is scored on a 5-point Likert format ranging from 1 "strongly disagree" to 5 "strongly agree". Items scored directly were responded to in the scoring range of 1–5 and reverse items scored in the range of 5–1. A high score indicates a high personality trait on the spectrum. John and Srivastava [43] obtained a Cronbach alpha of 0.90 for extroversion and agreeableness, while 0.92 were reported for conscientiousness, neuroticism, and openness to experience, and an overall score of 0.75. The researchers reported an overall Cronbach alpha coefficient of 0.79 and internal consistency reliabilities of the sub-scales ranged from 0.79 (neuroticism), 0.81 (extraversion), 0.71 (conscientiousness), 0.72 (openness to experience) and 0.75 (agreeableness) respectively. The scale has been validated and used in a similar context with acceptable reliability [44].

Multidimensional Scale of Perceived Social Support

The scale was developed by Zimet et al. [45] to measure perceived social support across cultures among adults. The Multidimensional Scale of Perceived Social Support (MSPSS) provides an assessment of three sources of support: family support, friends support, and significant others' support. It is scored on a 7-point Likert-type scale, ranging from (1) "strongly disagree" to (7) "strongly agree". Sample items include "I get the emotional help and support I need from my family", "I can count on my friends when things go wrong", and "There is a special person who is around when am in need". Zimet et al. [45] reported a Cronbach's alpha of 0.91, 0.87, and 0.85 for family, friends, and significant others' support respectively, and 0.85 as the reliability value of the total score. Zimet et al. [45] asserted that the scale can be used as a single construct, as used in the present study. The scale has been used in a similar study and context as a single construct with an acceptable reliability coefficient [46]. The present study reported α 0.74.

Resilience scale

This is a 14-item scale developed by Wagnild and Young [47] to measure the capacity to withstand life

stressors in a bid to thrive and make meaning from life's challenges. The items of the Resilience scale (R-14) are scored using a 7-point response format ranging from 1 "strongly disagree" to 7 "strongly Agree". Sample items include; "I usually take things in stride", and "my life has a meaning". A higher score on the RS-14 scale indicates more resilient characteristics. Wagnild and Young [47] reported a Cronbach's alpha coefficient of 0.83. In the present study, the researchers reported a reliability coefficient of 0.83. The scale has been validated and used in a similar context with acceptable reliability [48].

Positive Mental Health Scale

The Positive Mental Health Scale (PMH-Scale) developed by Lukat [49] was used to assess the mental health of family caregivers. It is a 9-item standardized self-administered screening test to measure mental health. The items in the instrument are scored on a 4-point response format ranging from 1 (not true) to 4 (true). Sample items include "I am in good physical and emotional condition", and "I am a calm and balanced human being". A higher score indicates high mental health. Lukat [49] reported a Cronbach alpha coefficient of 0.93. The researchers reported a Cronbach alpha coefficient of 0.89 in the current study. The scale has been validated and used in a similar context with acceptable reliability [50].

Data collection

The study was conducted between August and November 2023. Participants were met in the in- and outpatients wards. The researchers established rapport with the participants by introducing themselves (with the trained research assistants who were nurses in the hospitals used in the study) and explained the purposes of the research before seeking their participatory consent. The participants were expected to indicate their participatory consent by ticking the consent box in the questionnaire. All participants were duly informed that their participation was voluntary and that their data would remain confidential, which is ensured by the non-inclusion of any means of identification. Those who consented to participate in the study were asked to fill the copies of the questionnaire. The questionnaire could be completed between seven to fifteen minutes. The copies of the questionnaire that were filled immediately were collected back, while those copies of the questionnaire not filled immediately were collected subsequently after they were administered, especially for participants who were not disposed to give immediate attention to the questionnaire. The data collection lasted barely four months. After completion and collection, properly filled copies of the questionnaire were used for data analysis. Two hundred and seventy-seven copies of the questionnaire were returned, twenty-seven were discarded as a result of improper completion while two hundred and fifty (250) valid copies were used for data analysis, yielding a valid response rate of 87.1%, out of two hundred and eighty-seven (287) copies of the questionnaire that were initially distributed.

Ethical considerations

Approval for the study was granted by the Ethical Committee Board, Department of Psychology, University of Nigeria, Nsukka (D.PSY.UNN/REC/2023-07-1RB000021). Informed consent was obtained from the participants. All the ethical standards according to the Helsinki Declaration of 1975, as revised in 2000 (5) concerning human experimentation (institutional and national), were followed.

Statistical analysis

Pearson's correlation (r) was conducted to test the relationship among the study variables while hierarchical multiple regression analysis was used for data analysis. Mendenhall et al. [51] posited that hierarchical multiple regression analysis allows researchers to concurrently use several independent (or predictor) variables. By using more than one independent variable, one should do a better job of explaining the variation in the criterion (dependent variable) and hence be able to make more accurate predictions. Hence, hierarchical multiple regression was used to test the hypotheses.

Results

In Table 1, some variables were added as control over the criterion variables. Invariably none of the control variables correlated with mental health. The addition of personality dimensions directly below the control variable in the statistical equation showed that extraversion ($r = 0.27$, $p < 0.01$), openness ($r = 0.28$, $p < 0.01$), and agreeableness ($r = 0.24$, $p < 0.01$) positively correlated with mental health. Conscientiousness did not correlate with mental health whereas neuroticism was negatively associated with mental health ($r = -0.11$, $p < 0.05$). Social support also correlated positively with mental health ($r = 0.14$, $p < 0.05$). Resilience was also found to correlate positively with mental health ($r = 0.12$, $p < 0.05$).

In Table 2, step 1, personality traits, extraversion ($\beta = 0.16$, $p < 0.05$), openness ($\beta = 0.17$, $p < 0.05$), consciousness ($\beta = 0.15$, $p < 0.05$), and agreeableness ($\beta = 0.13$, $p < 0.05$) respectively associated positively with mental health. This implies that an increase in

Table 1. Correlations matrix among demographic factors and the study variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Gender	–																
2. Maritalstatus	0.20	–															
3. Age	0.06	0.69	–														
4. Educational qualification	0.08	0.52	0.49	–													
5. Employment status	−0.07	−0.61	−0.55	−0.41	–												
6. Extraversion	0.02	0.11	0.02	0.04	−0.01	0.023	0.01	−0.01	−0.11	–							
7. Openness	0.02	0.003	−0.01	0.05	0.05	0.06	0.02	−0.06	−0.06	0.68**	–						
8. Neuroticism	0.00	0.14*	0.03	0.07	−0.05	−0.03	−0.08	−0.06	−0.09	0.11*	0.09	–					
9. Conscientiousness	0.06	0.09	0.09	0.04	−0.08	0.06	−0.10	−0.08	−0.04	−0.20**	−0.24**	−0.08	–				
10. Agreeableness	−0.01	0.05	0.01	0.05	−0.01	0.05	−0.011	0.01	−0.02	0.35**	0.37**	0.12	−0.03	–			
11. Social support	0.01	−0.04	0.05	−0.08	0.07	−0.16**	−0.12*	−0.09	−0.01	−0.03	−0.01	−0.14*	0.11	0.03	–		
12. Resilience	−0.02	−0.01	0.05	−0.02	−0.03	−0.02	−0.06	−0.10	−0.09	−0.05	−0.16**	−0.02	0.05	−0.02	0.18**	–	
13. Mental health	−0.01	0.01	−0.02	−0.03	−0.05	0.12*	0.04	−0.01	0.07	0.27**	0.28**	−0.11*	0.09	0.24**	0.14*	0.12*	–

**p < 0.01; *p ≤ 0.05; gender (0 = male, 1 = female); educational qualification: 1 — FSLC, 2 — WACE/SSCE, 3 — degree

these traits leads to the experience of positive mental health among family caregivers, whereas neuroticism is negatively associated with mental health ($\beta = -0.15$, $p < 0.05$). This shows that there is an inverse relationship between this trait and mental health, implying that neuroticism leads to decreased mental health among family caregivers. Thus, hypothesis 1 was supported. The result also indicates that personality traits contributed 15% variance in mental health.

Social support when added in step 2 of the equation positively associated with mental health ($\beta = 0.13$, $p < 0.05$); thus, hypothesis 2 was supported. This shows that an increase in social support experienced by family caregivers leads to an increase in their mental health. Social support contributed 16% variance in mental health.

Resilience when added in step 3 of the equation positively associated with mental health ($\beta = 0.13$, $p < 0.05$); thus, hypothesis 3 was supported. This implies that an experience of increase in resilience among family caregivers invariably increases their mental health. The contribution of resilience in explaining variance in mental health was 17%.

Discussion

This study investigated the roles of the big five personality traits, social support, and resilience on the mental health of family caregivers. In other words, the researcher explored first, whether each dimension of the big five personality traits (neuroticism, extraversion, agreeableness, conscientiousness, and openness to experience) were associated with mental health; second, whether social support was associated with mental health and third, whether resilience was associated with mental health of family caregivers.

The findings of the study showed that personality traits (extraversion, conscientiousness, openness to experience, agreeableness, and neuroticism) were significantly associated with the mental health of family caregivers, thus hypothesis 1 was supported, which states that personality traits (extraversion, conscientiousness, openness to experience, agreeableness, and neuroticism) significantly associates with the mental health of family caregivers. Thus, the findings of the study showed that personality traits (extraversion) were positively and significantly associated with the mental health of family caregivers. This finding is consistent with previous findings [25, 26], which revealed that extraversion was positively associated with mental health. This is pertinent because extraversion is characterized by high levels of activity, sociability, and a greater tendency to experience positive outcomes

Table 2. Hierarchical multiple regression of personality, social support and resilience as predictors of mental health

Variable Predictors	Step 1		Step 2		Step 3	
	β	t	β	t	β	t
Extraversion	0.16	2.17*	0.16	2.27*	0.15	2.07*
Openness	0.17	2.22*	0.15	2.11*	0.19	2.55*
Neuroticism	−0.15	−2.83*	−0.13	−2.48*	−0.13	−2.52*
Conscientiousness	0.15	2.75*	0.14	2.47*	0.13	2.52*
Agreeableness	0.14	2.38*	0.13	2.29*	0.12	2.25*
Social support			0.13	2.45*	0.11	1.97*
Resilience				0.13	2.45*	
Adjusted R^2	0.15		0.16		0.17	
ΔR^2	0.15		0.02		0.02	
ΔF	10.88**		6.01*		6.03*	

* $p < 0.05$; ** $p < 0.01$; β — beta coefficient; t — t-statistic

[16]. In addition, highly extroverted individuals appear to have better perception and orientation to mental health, lower rate of depression, and negative emotion. Equally, Rastami et al. [26] postulated that individuals with extraversion traits are more prone to adaptive coping strategies, lower burden and stress, and better mental and physical health due to their disposition towards life orientation. Thus, it could be affirmed that family caregivers with such personality disposition maintain a sense of their own well-being through social relationships, and involvement in activities that have the potential of enhancing their self-worth, which aids in managing psychological tension [37].

In addition, the personality trait of openness to experience was positively associated with the mental health of caregivers. The result agrees with the findings of Löckenhoff et al. [27], which showed that openness to experience is a positive indicator of mental health. This is pertinent because greater mental flexibility of open-minded individuals facilitates adjustment to novel situations and thus, promotes cognitive, emotional, and physical well-being. Thus, it could be affirmed that family caregivers with traits of openness to experience exhibit greater in-depth knowledge and complexity to mental life experiences, coupled with their willingness to explore novel things and ability to think widely amid challenges. This gives them a wider perspective in handling work-role demands with undue pressure on their mental health.

In the same vein, neuroticism was negatively associated with family caregivers' mental health. This aligns with extant studies [52], which found that neuroticism is negatively associated with negative emotions and feeling easily overwhelmed by stressful experiences that affect mental health. Thus, increased vulnerability of stressors among family neurotic caregivers may have grave deleterious effects on such individuals' hassles of daily life as a result of their caregiving obligations. Hence, it could be affirmed that family caregivers with neurotic traits of personality are associated with greater sensitivity to caregiving-related stressors, burden and distress, maladaptive coping strategy, worse physical and subjective mental health, and fewer health-promoting behaviors [53].

Conscientiousness equally has a positive association with the mental health of family caregivers. Previous studies [54, 55] have evidenced that conscientiousness is linked to greater health-promoting behaviors, better subjective and objective health, lower risk of mortality, and cognitive impairment because they are highly disciplined and organized. In addition, highly conscientious caregivers report a sense of competence and confidence, which is a recipe for better mental health. Lewis and Cardwell [56] asserted that caregivers with conscientiousness personality traits have a better relationship with the care recipient because of their adaptive coping strategy and high level of organization and confidence in the face of challenges.

In the same vein, agreeableness is positively associated with family caregivers' mental health. The finding aligned with Day et al. [29] and Rastami et al. [26] studies, which found a significant positive relationship between agreeableness and mental health. These studies evidenced that people with higher levels of agreeableness exhibit higher levels of mental well-being. It could be contended that family caregivers with agreeableness trait of personality

tend to have more positive reassessment in different situations which facilitates effective coping skills and strategy, thereby giving them greater control over life; which in turn expands their interaction and quality of life with increased positive mental health [28]. Furthermore, self-determination theory [57] gives credence to the direction of the results on personality traits. The theory is based on the premise that people have natural inclinations towards growth and actively seek to control their environment and interactions by integrating novel experiences into their sense of being, based on their individual dispositions. To achieve this, different orientations in individual personality traits (causality orientation model) affect their response to environmental stimuli and influence the impact of such stimuli on their behavioral response patterns in terms of decision-making and behavior regulation. However, family caregivers' ability to maintain optimal health through satisfaction of their needs and carrying out their work-role demands is dependent on the combination of internal, external, and contextual factors. Thus, it could be argued that family caregivers' ability to maintain optimal mental health is dependent on their ability to navigate through the internal, external, and contextual factors in their job context; based on their varied causality of orientations model (personality traits) developed through active environmental control, interactions and integration of novel experiences.

Furthermore, there was a strong positive association between social support and the mental health of family caregivers; thus, hypothesis 2 was supported, which states that social support is significantly associated with the mental health of family caregivers. This implies that an increase in perceived social support received by family caregivers invariably enhances their mental health. Social support is fundamental in caregiving because caregiving has been considered a prototypic example of negative health and a consequence of chronic stress [58]; where a caregiver is sometimes described as the hidden patient. Based on the premise that there is considerable variability in individual experiences with regard to unequal risk for adverse health outcomes among caregivers; promoting resources such as social support is imperative among caregivers. The finding agreed with previous studies [*e.g.*, 35], which suggest that mental health is dependent on the correlation between psychosocial factors or characteristics (*e.g.*, social support) and contextual factors. However, family caregivers who have access to perceived social support when needed exhibit a higher level of emotional stability and satisfaction and are responsive to environmental and contextual challenges. Equally, family caregivers with social support believe that they are loved and cared for, esteemed and valued which shows that the quality of social relationships is dependent on one's mental health [37]. In addition, it could be argued that social support experienced by family caregivers facilitates a higher quality of life and adaptation of specific coping skills that serve to maintain emotional stability and function, with less report of distress [33]. Equally, this finding supports the tenets of social support theory [34], which centers on the analogy that instrumental, informational, and emotional support from significant figures increases pro-active health-related behaviors among individuals. This is pertinent because social support reduces negative emotions, stress, and mental health-related issues with prompt and apt responsiveness to contextual and environmental challenges [30]. Corollary, social support facilitates caregivers' health status, health behaviors, and use of health services. Thus, family caregivers with perceived supportive societies and supportive relationships experience positive health-related behaviors that improve their mental health.

Corollary, resilience was significantly and positively associated with family caregivers' mental health; thus, hypothesis 3 was supported, which states that resilience is significantly associated with the mental health of family caregivers. This is in agreement with previous studies [38, 39], which revealed that individuals with higher resilience reported fewer instances of mental health-related issues because resilience strengthens positive indicators of mental health while attenuating the negative ones. The finding can be explained by a salutogenic model of resilience [40], which looks beyond the whole idea of risk exposure as a pre-requisite for being tagged "resilient" and rather emphasizes factors that contribute to health and well-being such as coherence and resistance. The model focuses on coping resources that could contribute to resilience and adjustment, notwithstanding adversities and risk. More so, family caregivers with attributes of resilience can navigate their way to the psychological, social, cultural, and physical resources that sustain their well-being due to their coping skills [38]. Therefore, resilience promotes succor and adequate coping under threats of various health-related stressors. Thus, maintaining higher resilience levels among caregivers is of great importance in keeping them protected from mental health-related problems [38].

This finding supports the tenets of Block and Block's [39] model of ego control and ego resilience, which suggests that integrating the recognized dynamics of healthy attachments such as permeability and elasticity facilitates individual well-being. This portrays that resilience is instrumental in effective resourceful

adaptation to transition, change, conflict, and growth. Thus, family caregivers with resilience prototypes are associated with prosocial and self-regulatory behaviors [40], which encourage greater cognitive flexibility, increased engagement, goal-directed activities, and optimal mental health. In addition, Biswas et al. [38] posited that elements of human dynamics such as tenacity, decisiveness, self-control, innovativeness, optimism, honesty, and integrity are apt in the ability to cope, learn, and grow from different situations. Hence, it could be argued that caregivers with such resilient attributes tend to maintain optimal mental health irrespective of the challenging work demands they encounter; since they can adapt effectively in the face of life adversities.

Implications of the findings

The present research has some practical implications for practice. First, the findings showed that personality, social support, and resilience influence mental health, especially the family caregivers; thus, highlighting the need for personality assessment, social cohesion, fusion, and integration of family caregivers at the beginning of the caregiving relationship. This is pertinent because empirical evidence has shown that personality trait as an underlying factor is an important predictor of mental health. Corollary, personality assessment will aid in developing and designing supportive services and programs that will enhance family caregivers' psychological, emotional, and health needs, needed for caregiving relationships and outcomes.

In addition, families and management of healthcare providers should take cognizance of the importance of social support services in the healthcare delivery system. Evidence has shown that the caregivers' mental health is dependent on the level of perceived social support received by them in the discharge of their duties.

Furthermore, caregivers should be enlightened on the techniques to build resilience (*e.g.*, perseverance, self-control, interpersonal connectedness, innovativeness) for coping ability from different experiences due to the nature and dynamics of their work-role demands. This is imperative because the maintenance of relatively stable, healthy levels of psychological and physical functioning and the ability to generate new experiences and positive emotions is required over time among the caregivers, in order to achieve optimal mental health. These ideals can be achieved through familial support, collegial support, self-care, and growth experience.

Empirically, this research has added to the literature on mental health among caregivers in the neglected African context. Based on the review of the literature, this present study appears to be one of the first attempts to empirically test the big five personality traits (neuroticism, extraversion, conscientiousness, openness to experience, and agreeableness) on mental health among family caregivers in Africa context *vis-à-vis* social support and resilience. Thus, the study has opened future research areas in this direction.

Limitations of the study

Although the methodology deals adequately with the manifest variables, critical latent variables cannot be suitably accounted for by the use of a purely quantitative approach; due to the complex and multi-faceted nature of personality. Thus, a deeper understanding of the roles of personality, social support, resilience, and mental health can be attained using both quantitative and qualitative approaches. Thus, the mixed-method approach in investigating mental health among informal caregivers is worthwhile and should be considered by future researchers. In addition, the present study is based on self-reported data. This may be prone to the risk of social desirability responses, even though the possible problem of common error bias was reduced through confidentiality and anonymity in participants' responses.

Conclusions

The findings suggest that personality traits (neuroticism, conscientiousness, extraversion, openness to experience, and agreeableness), have a diverse influence on caregivers' mental health. Thus, the imperativeness of these personality attributes to the well-being of caregivers is *sine-qua-non* in treatment outcomes among recipients of caregiving. Equally, the finding illuminated the importance of social support as being pivotal in caregivers' maintenance of optimal mental health. This is pertinent since the quality of social relationships is dependent on one's mental health, since it facilitates positive social communication and support, reduces anxiety and depression, and develops the feeling of self-worth and security.

Furthermore, the findings revealed that resilience is an effective mechanism for the resourceful adaptation to transitions of life challenges in the discharge of work-role demands by family caregivers. This is pertinent because the elements of resilience akin to human dynamics such as tenacity, decisiveness, honesty and integrity, self-control, innovativeness, and optimism; strengthen positive indicators of mental health and buffer their general well-being. Designing intervention and support services for caregivers who may be susceptible to poor mental health will provide

an avenue for such caregivers to adapt, improve treatment outcomes of the recipient of caregiving, and actualize their career goals.

In sum, the researchers suggested that people are susceptible to poor mental health, due to the absence of social support, resilience, and variation in personality traits. Therefore, in light of the present findings, personality, social support, and resilience may have a protective effect on the psychological, physical, and physiological state of the family caregivers in the course of discharging their work roles. Thus, having a nuanced understanding of these constructs will help caregivers improve problem-solving management, and acquire coping strategies and life skills needed to reduce emotional burdens associated with caregiving in order to maintain optimal mental health.

Article information and declarations

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Data availability statement
The datasets generated and analyzed during the current study will be available from the corresponding author upon reasonable request.

Ethics statement
Ethical approval No D.PSY.UNN/REC/2023-07--1RB000021. All procedures followed were under the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5).

Author contributions
Conceptualization, project administration, supervision, resources, methodology, and writing of the original draft, review, and editing — OOI; conceptualization, methodology, draft, formal analysis, software, validation, review, and editing — IJN; methodology, draft, formal analysis, project administration, supervision, resources — PCA.

Conflict of interest
The authors declare no known conflicts of interest.

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