Interpersonal Support Domains Associated With Symptoms of Posttraumatic Stress Among Older Black and White Adults

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ABSTRACT

Objective: Older adults experience numerous changes in their social networks and social environment that may worsen preexisting posttraumatic stress disorder (PTSD) symptoms. This study tested whether tangible support, appraisal support, belonging support, and self-esteem were associated with trauma symptom burden among community-dwelling older Black and White adults at baseline and over 12 months of follow-up.

Methods: This study used data collected from a randomized controlled trial for depression prevention in adults 50 years of age or older who had subsyndromal depression (2006–2011). Two hundred forty-four participants (including 90 older Black adults) were randomly assigned to a problem-solving therapy arm or an active control arm. The Interpersonal Support Evaluation List (ISEL) was administered at baseline and 12 months later. Linear regression analysis was used to examine associations of each of the ISEL dimensions with *DSM-IV*–defined PTSD symptoms at baseline and over time, with control for well-established correlates of PTSD including depression, anxiety, and sleep quality.

Results: Participants were a mean (SD) of 65.6 (11.0) years of age, and 71% percent were female. Belongingness support was the only dimension of interpersonal support significantly associated with PTSD symptoms at baseline ($\beta = -0.192$, $t = -3.582$, $P < .001$) and 12 months later ($\beta = -0.183$, $t = -2.735$, $P < .01$). Regression models accounted for a large proportion of variance in PTSD symptoms. The association between belongingness support and PTSD symptoms did not vary by participant race.

Conclusions: A strong perception of belongingness to family and/or friends was associated with fewer PTSD symptoms at baseline and over 12 months. This observation generates the hypothesis that behavioral interventions which directly target and modify interpersonal support may benefit both older Black and older White adults who have experienced trauma.

Trial Registration: ClinicalTrials.gov identifier: NCT00326677

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Posttraumatic stress disorder (PTSD) is estimated to have a point prevalence of up to 4% in older adults[1] and a lifetime prevalence from 4.5%[2] to 8%,[3] with up to 15% of older adults having subclinical PTSD.[4] PTSD is characterized by intrusion symptoms, avoidance behaviors, negative cognitive thoughts and mood, and hyperarousal[5] that may be chronic or wax and wane over a lifetime.[6] However, PTSD may present uniquely in older adults. For example, somatic symptoms are more common than in younger adults, and older adults may also experience more intense hyperarousal symptoms.[7,8] Furthermore, older adults display fewer of the "typical" PTSD symptoms including negative mood, guilt, avoidance, and intrusive flashbacks.[7–9]

There are significant racial disparities in exposure to traumatic events and the development of PTSD. Data from large nationally representative surveys consistently show that Black adults have the highest prevalence of PTSD compared to White, Hispanic, and Asian adults.[10–12] There are also racial differences in PTSD symptomatology. In a sample of veterans, Black adults were more likely to report re-experiencing symptoms when compared to White adults.[13] Black adults may be at higher risk for PTSD because of cumulative socioeconomic disadvantage and racial stressors such as discrimination that inhibit their ability to respond to traumatic events.[11,14,15] They may also have limited access to specialty mental health and other social resources that buffer the impact of traumatic events on health and well-being.

There is a dearth of research analyzing PTSD in the late-life community population, as most studies have been conducted on veteran populations. Combat related PTSD

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Clinical Points

- Social disconnection may worsen symptoms of posttraumatic stress disorder (PTSD) in late life. Understanding racial differences in the association between social support and PTSD may inform future intervention efforts for diverse samples of older adults.
- For older Black and White patients, increasing belonging support may reduce symptoms of PTSD.

presents with different symptoms than civilian PTSD, such as increased psychological reactivity in combat-related trauma.[16] Similarly, there are minimal studies on comorbid PTSD and depression in older adults, although up to 52% of adults have both conditions.[17,18] Adults with comorbid PTSD and depression have decreased response to depression interventions as compared to adults with depression alone in some[19–21] but not all studies.[22]

Social Support and Posttraumatic Stress Disorder

Social support plays a significant role in the development and maintenance of PTSD.[23,24] Social support is particularly relevant to PTSD in late life because older adults experience numerous changes to their social network including social isolation, bereavement, and loss of support people, which may worsen preexisting PTSD symptoms.[6] Social disconnection—both objective isolation and perceived loneliness—is associated with higher rates of depression, accelerated cognitive decline, suicide, and all-cause mortality.[25–27] The effects of social disconnection on health and well-being differ by race/ethnicity. Some studies show that older adults from minoritized racial groups have higher levels of loneliness due to sociocultural factors that include racism and discrimination.[28,29] However, other studies have shown some protective aspects due to cultural norms of intergenerational households and informal social support networks.[30] In terms of social support and PTSD, Black adults are more likely to rely upon support from their family and the community when dealing with a traumatic event compared to White adults.[31]

There are several reasons why social disconnection may worsen PTSD in late life. First, older adults may lose prior adaptive strategies to manage traumatic memories, such as employment and socializing with others, which may result in worsening of PTSD symptoms. Second, memories of traumatic events earlier in life may return with great force and intrusiveness in older adulthood because older adults often have more time to reflect on traumatic memories they had previously suppressed or avoided.[6,32] Finally, older adults may have more time to integrate past traumas into their sense of self (or identity) and beliefs about others, which may cause significant distress in late life.[33] It is possible that social support buffers against PTSD by helping adults improve their worldview as they realize that some people value them and can be trusted. Taken together, the evidence suggests that changes in social support are common in late life and may lead to changes in symptoms of PTSD.

A small but growing body of literature shows that strengthening social supports via psychotherapy may be efficacious in treating PTSD. For example, interpersonal psychotherapy (IPT) targets social connectedness and has been shown to improve PTSD symptoms in adults.[34–36] Similarly, in an older adult veteran population who participated in exercise programs, improved perception of social connection was associated with a reduction in PTSD symptoms.[37] In another study in veterans, social support measured over multiple domains moderated a reduction in PTSD symptoms in prolonged exposure therapy.[38] However, none of the studies conducted analyses by race. The present study examines racial differences in the association between interpersonal support and symptoms of PTSD.

Current Study

The purpose of this study was to prospectively explore whether interpersonal support domains were related to symptoms of PTSD in a community-dwelling sample of older Black and White adults who had subthreshold depression. We tested whether tangible support (provision of goods and services), appraisal support (expression of empathy and affection), belonging support (feeling of security and inclusion within a group), and self-esteem were associated with PTSD symptom burden at baseline and over 12 months of follow-up. We hypothesized that (1) greater perceptions of interpersonal support would be associated with fewer symptoms of PTSD and (2) improvement in interpersonal support would be predictive of reductions in symptoms of PTSD over a 12-month follow-up period. We also explored whether the association between interpersonal support domains and symptoms of PTSD varied by race.

METHODS

Study Design

This study used data collected from a randomized controlled trial (RCT), sponsored by the National Institute for Minority Health and Health Disparities, for indicated depression prevention: "Primary Prevention of Major Depression in Later Life" (2006–2011; ClinicalTrials.gov identifier: NCT00326677). The methods and outcomes of this RCT have been previously described.[39] Participants were randomized to receive Problem Solving Therapy for Primary Care (PST-PC) or an active control arm targeting education about healthy dietary practices (DIET). The broad goal of the RCT was to recruit and retain enough Black participants to determine the impact of race on

the efficacy of PST-PC to prevent episodes of MDD. Participants received 6–8 intervention sessions in addition to booster sessions at 3, 9, and 15 months. The primary outcome was incident episodes of major depressive disorder as defined by the *DSM-IV* diagnostic criteria.[40] Data from clinical and self-report assessments were collected at baseline and every 3 months for 24 months.

Participants

Participants were adults aged 50 years and older who reported subclinical levels of depression symptoms, defined by a score ≥ 11 on the Centers for Epidemiologic Studies Depression Scale.[41] Participants were also required to have a Mini-Mental State Examination[42] score ≥ 24 to rule out probable dementia. Exclusion criteria included an episode of major depression or substance use disorder in the past 12 months and a history of bipolar disorder, psychotic disorder, or neurodegenerative disorder. The 244 participants were enrolled at baseline, and the 209 participants who had follow-up data on interpersonal support and symptoms of PTSD are the focus of this report.

Measures

Posttraumatic stress. Our primary outcome was symptoms of PTSD, as measured by the PTSD Checklist (PCL) for *DSM-IV*.[43] The PCL is a 20-item self-report questionnaire that asks about symptoms of PTSD on a 5-point Likert-type scale ranging from 0 (Not at all) to 4 (Extremely). Sample items include: "In the past month, how much were you been bothered by: 'repeated, disturbing, and unwanted memories of the stressful experience?' and 'blaming yourself or someone else for the stressful experience or what happened after it?'" The 20 items are summed (range, 0–80), with higher scores indicating greater symptom severity of PTSD. A PCL threshold score in the range of 31–33 is indicative of probable PTSD.

Interpersonal support. The 40-item Interpersonal Support Evaluation List (ISEL)[44–46] was used to measure individuals' perceived availability of potential social resources. The ISEL consists of 4 domains of perceived support: tangible support (material aid), appraisal support (resources available to talk to someone), self-esteem (positive self-image), and belonging support (people available to do activities with).[45] Participants rate each item on a scale of 0 (definitely false) to 3 (definitely true). Items are summed, with higher scores indicating a stronger perception of social support (total score range, 0–120; domain score range, 0–30).

Correlates of PTSD. We controlled for variables known to be associated with symptoms of PTSD in older adults, including age, sex, race, depression, anxiety, and poor sleep quality. Age was analyzed as a continuous variable. Sex was categorized as male or female. Race was categorized as Black or White. Depression symptoms were measured with the Beck Depression Inventory.[47] Anxiety symptoms were measured with the Brief Symptom Inventory.[48] Sleep quality was measured with the Pittsburgh Sleep Quality Index.[49]

Table 1.
Participant Characteristics (N = 244)[a]

Variable	Mean (SD) or % (n)
Sociodemographics	
Age, y	65.61 (11.04)
Race, % (n)	
Black	36.90 (90)
White	63.10 (154)
Female, % (n)	71.30 (174)
Education, y	14.52 (2.74)
Clinical Characteristics	
Posttraumatic stress (PCL)[b]	28.46 (7.88)
Social support (ISEL)[c]	
Self-esteem	7.81 (2.17)
Belongingness support	8.72 (2.77)
Appraisal support	8.86 (2.72)
Tangible support	8.73 (2.61)
Anxiety symptoms (BSI)[d]	0.51 (0.50)
Depression symptoms (BDI)[e]	10.51 (5.74)
Sleep quality (PSQI)[f]	8.21 (3.59)

[a]Data are shown as mean (SD) unless otherwise noted. Whether Black participants were indeed African American who were born in the US was not known.
[b]n = 203.
[c]n = 206 or 207.
[d]n = 232.
[e]n = 230.
[f]n = 224.
Abbreviations: BDI = Beck Depression Inventory, BSI = Brief Symptom Inventory, ISEL = Interpersonal Support Evaluation List, PCL = Posttraumatic Stress Disorder Checklist for *DSM-IV*, PSQI = Pittsburgh Sleep Quality Index.

Statistical Analyses

Analyses used separate linear regression models to evaluate associations of interpersonal support (tangible, appraisal, belonging, and self-esteem) with PTSD symptom outcomes. Age, sex, anxiety, depression, and sleep quality were included in regression models as covariates because of their well-established associations with PTSD. Separate regression models were fitted for each interpersonal support domain. We next tested whether improvement in interpersonal support would be predictive of reductions in symptoms of PTSD over a 12-month follow-up period. Our outcome measure was PTSD symptom change and was defined as the difference in PCL scores at baseline and 1-year follow-up. Included in the model were change variables for depression and anxiety, intervention group (PST-PC or DIET), as well as age, sex, and sleep quality at baseline.

Recruiting and retaining a racially diverse sample of older adults was a key element in the design of the original RCT; therefore, we compared mean scores for interpersonal support domains and symptoms of PTSD between older White and Black adults. We

Table 2.

Linear Regression Analyses Examining the Association at Baseline Between Interpersonal Support Domains and Symptoms of PTSD[a]

Social Support Domain	B	SE (B)	β	*t*	*P* Value
Self-esteem[b]	−0.041	0.207	−0.011	−0.196	.845
Belongingness support[c]	−0.546	0.153	−0.192	−3.582	**<.001**
Appraisal support[d]	−0.220	0.154	−0.076	−1.425	.156
Tangible support[e]	−0.024	0.160	−0.008	−0.150	.881

[a]All models controlled for age, sex, race, anxiety symptoms, depression symptoms, and sleep quality. Boldface indicates statistical significance at the $P < .05$ level.
[b]Self-esteem model: $F_{7, 190} = 30.563$, $P < .001$, $R^2 = 0.53$.
[c]Belongingness support model: $F_{7, 189} = 34.302$, $P < .001$, $R^2 = 0.56$.
[d]Appraisal support model: $F_{7, 190} = 31.168$, $P < .001$, $R^2 = 0.53$.
[e]Tangible support model: $F_{7, 189} = 30.390$, $P < .001$, $R^2 = 0.53$.
Abbreviation: PTSD = posttraumatic stress disorder.

Table 3.

Multiple Regression Model Exploring Change in Symptoms of PTSD Over 12 Months[a]

Variable	B	SE (B)	β	*t*	*P* Value
Age	0.003	0.047	0.003	0.053	.96
Female	−2.012	1.241	−0.108	−1.621	.11
Black/African American	0.622	1.088	0.038	0.572	.57
Intervention group	−0.873	1.031	−0.055	−0.847	.40
Baseline posttraumatic stress	−0.502	0.081	−0.465	−6.229	**<.001**
Baseline sleep quality	−0.090	0.153	−0.040	−0.591	.56
Change in depression	0.389	0.108	0.264	3.618	**<.001**
Change in anxiety	0.000	0.001	0.020	0.310	.76
Change in belongingness support	−0.557	0.203	−0.183	−2.735	**.01**

[a]Change in posttraumatic stress was defined as the difference in PCL scores from baseline to 12-month follow-up. Bolded values are significant at the $P < .05$ level. Model: $F_{9, 128} = 14.034$, $P < .001$, $R^2 = 0.50$.
Abbreviations: PCL = Posttraumatic Stress Disorder Checklist for *DSM-IV*, PTSD = posttraumatic stress disorder.

also added an interaction term in our regression models to determine if participant race moderated the association between interpersonal support domains and symptoms of PTSD. For all analyses, *P* values smaller than .05 were statistically significant. All analyses were performed using SPSS, version 27.0.

RESULTS

Descriptive Statistics

Table 1 shows descriptive information for the 244 adults at baseline. The mean (SD) age of participants was 65.6 (11.0) years (range, 50–96 years). The total sample was 29% men (n = 70), and 37% (n = 90) were Black. Mean (SD) score on the PCL was 28.5 (7.9), which is slightly below the suggested cutoff score range (31–33) indicating probable PTSD. Mean scores on the ISEL ranged from 7.8 to 8.9 (range, 0–10), indicating a strong sense of interpersonal support. Several group differences emerged between older Black adults and White adults. The analysis of variance (ANOVA) test with Bonferroni correction was used to compare demographic and clinical characteristics between White and Black participants. Compared to White participants, Black participants had fewer years of education (mean [SD] = 13.32 years [2.21] years versus 15.23 [2.78] years; $F_{1, 242} = 30.86$, $P < .001$) and worse sleep quality (mean [SD] PSQI score = 9.08 [3.46] versus 7.69 [3.58]; $F_{1, 222} = 8.14$, $P < .01$) (data not shown). The two groups were similar in terms of age, sex, depression, anxiety, interpersonal support, and posttraumatic stress.

At the 12-month follow-up assessment (n = 209), mean (SD) score on the PCL (24.7 [6.6]) was significantly lower than mean (SD) PCL score at baseline ($t_{157} = 5.165$, $P < .001$). Mean scores on several ISEL domains significantly improved over the 12-month follow-up: belongingness support ($t_{158} = -2.974$, $P < .01$), appraisal support ($t_{158} = -4.318$, $P < .001$), and self-esteem ($t_{158} = -2.313$, $P < .05$).

Interpersonal Support and Symptoms of PTSD

A greater sense of belongingness support was associated with fewer symptoms of PTSD (see Table 2). None of the other dimensions of interpersonal support were associated with symptoms PTSD. The participant race × belonging support interaction did not reach significance in both our cross-sectional ($P = .32$) and follow-up models ($P = .38$). Follow-up analyses showed that improvement in belongingness support was correlated with reductions in symptoms of PTSD over a 1-year follow-up (see Table 3). These estimates come from models that included change in depression, change in anxiety, intervention group, and baseline PTSD as covariates. These models accounted for a large proportion of variance in PCL scores ($R^2 = 0.56$ in Table 2 and R2 = 0.50 in Table 3).

Further analyses used logistic regression to examine a dichotomous outcome of PTSD: probable PTSD (positive screen) and none/minimal symptoms (negative screen). This model produced similar results, but additionally specified that less appraisal support was associated with higher odds of probable PTSD (odds ratio = 0.84; 95% confidence interval, 0.73–0.96) compared with the reference group of none/minimal symptoms (data not shown).

Post Hoc Analyses

The finding that belongingness support was associated with fewer symptoms of PTSD and associated with change over time raised questions about interventions to reduce symptoms of PTSD by targeting/modifying belonging support. We therefore conducted two post hoc analyses. One analysis compared trajectories of PCL scores and ISEL scores between the learning-based intervention arm (PST-PC) and active control arm (DIET). We employed a mixed-effects model using treatment assignment

(PST-PD versus DIET), time (baseline and 1-year follow-up), and assignment × time interaction as correlates of the PCL and ISEL. No significant main or interaction effects emerged in either model (data not shown). The other analysis explored the association between trauma symptom clusters (ie, recurrent distressing memories of the traumatic event, avoidance of stimuli associated with the traumatic event, and hypervigilance) and belongingness support. These regression models included the aforementioned covariates and additionally found that a greater sense of belongingness was associated with fewer avoidant behaviors. The other symptoms clusters were not associated with belongingness support (data not shown).

DISCUSSION

In a community-based sample of older Black and White adults with subsyndromal depression, we found that belonging support was the only statistically significant interpersonal support measure associated with symptoms of PTSD. A greater sense of belongingness to family and/or friends was associated with less symptom burden of PTSD. Moreover, improvement in belonging support was correlated with a reduction in PTSD symptoms over a 1-year follow-up. We also found that lower belongingness and appraisal support was associated with higher odds of probable PTSD. A major strength of this study is the proportion of Black participants who were retained over follow-up (71% [n = 66 of 93]), which allowed us to analyze potential health disparities in interpersonal support domains.

Belonging support measures the perception of the ability to do activities with others. This contrasts with appraisal support (the ability to talk with another empathic person), tangible support (the ability to receive material help from others), and self-esteem (positive perception of oneself compared to others) and suggests that spending time with others is particularly important in reducing PTSD symptoms. Much attention had been paid to the devastating health effects of social isolation and loneliness in older adults.[26] Given the impact of COVID-19 on social isolation in these populations and the loss of peers, interventions that address belongingness are even more warranted. Cohen and Wills[50] theorized that social support prevents traumatic or stressful events from becoming pathological by acting as a buffer against the development of the pathological stress responses. Feelings of belongingness may reduce the stress response by serving as a distraction from the stressor.[50] Similar to our findings, an increased sense of belonging is associated with lower levels of PTSD symptoms in college populations,[51,52] and having a sense of community with others has been suggested to buffer the stress response in college-aged students.[53] Thus, belongingness may represent a positive coping strategy (spending time with others) and/or a sense of community to do activities with, both of which may buffer against PTSD symptoms.

Participants' scores on the ISEL suggest strong feelings of belongingness support at baseline, and despite this high level of support, improvement in belongingness was associated with significant declines in symptoms of PTSD in two interventions that did not specially target social support or interpersonal functioning. This finding is reminiscent of the concept of the "trial effect" or participation benefit, which is the benefit that participants experience simply by participating in a clinical trial, that goes beyond the effects of the intervention.[54] Given that Black individuals experience numerous barriers to clinical research participation including fear and mistrust of research, a positive trial effect is noteworthy.[55,56] Belongingness is a concept that has not been researched as a potential moderator or mediator of clinical efficacy in mental health clinical trials. Participants may perceive themselves to be an integral part of a system or research environment where their personal involvement is valued and accepted. Individuals' perceptions of their interactions and relationships with the research team may be powerful determinants of health and well-being. Because the original research team built strong relationships with community mental health champions, it is possible that older participants felt that they "belonged" in the original RCT in a way that they might not have felt in a different study. We partnered with a Black pastor/administrator of a church-based clinic in a predominantly Black neighborhood of Pittsburgh. She became a champion for our project and helped the forging of trusting relationships with participants. As favorable reports about the project circulated through the community, we were able to establish a positive cycle that supported enrollment of older Black participants.

PTSD and subclinical PTSD are common in older adults. Recently, the Nurses' Health Study[57] highlighted the prevalence of PTSD in women aged 53–74 years: 82.2% of participants reported experiencing at least one trauma in their life, with 8.7% of participants having met diagnostic criteria for PTSD over their lifetime. In our sample, a substantial proportion of community-dwelling older adults (30% of Black participants [n = 24 of 81] and 33% of White participants [n = 41 of 125]) met criteria for probable PTSD (defined as a threshold score ≥ 31 on the PCL) at baseline. Our study also found that less belonging support and less appraisal support was associated with higher odds of probable PTSD. This finding suggests that the combination of both poor perception of belonging and limited perceived ability to talk to others may predispose individuals to PTSD diagnosis. Appraisal and belongingness support may be protective factors against PTSD, perhaps suggesting participants with higher appraisal support also had higher baseline resilience.[58] Higher baseline resilience may protect against the development of PTSD.[59] Studies suggest resilience plays a factor in the development of PTSD in older adults,[60] and more social support is strongly

associated with more resilience.[61] Psychotherapy and behavioral activation have been shown to reduce PTSD symptoms,[34–36,62,63] which further suggests appraisal support or the ability to talk with others may be important in clinically significant PTSD. Further research on therapy, appraisal support, and PTSD will be important to help clarify the role of appraisal support in PTSD.

Few studies specifically analyze belonging support as an intervention target for reducing symptoms of PTSD in older adults, and the ones that do fail to include enough Black participants in the study sample. One study[37] found that an older adult veteran population who participated in exercise programs had improved perception of social connection, which was associated with a reduction in PTSD symptoms. Thus, group activities, including process groups, may be one possible intervention to target belonging.[32,64] Facilitating creation of new social networks may also be a target for increasing belonging in older adults.[64] A randomized controlled trial[36] showed that IPT was noninferior to prolonged exposure (PE) and relaxation therapy, suggesting that IPT may be a specific type of psychotherapy that indirectly targets belongingness. In our sample, belongingness support improved over the duration of study participation. However, the lack of an intervention effect on ISEL domains suggest that components of both interventions (PST-PC and DIET) hold promise for improving belongingness in community-dwelling older adults: interventionists in both arms helped participants deal with a problem associated with managing their health in the context of living with depression and trauma.

This study has several limitations. First, the original study was designed to measure the indicated prevention of major depressive disorder, not PTSD symptoms, and as a result our sample may not be representative of older adults who report trauma and/or symptoms of PTSD. Future studies should recruit a larger, more representative sample that includes a range of PCL scores including mild and clinically significant symptom burden. Second, most of the Black participants were recruited by a clinic in a predominately Black neighborhood coordinated by a minister. As a result, Black participants were already benefiting from social support, and many of them also belonged to churches. Future inquiry of belonging support's role in PTSD management is warranted among older adults who are less connected with support people. Third, the tested interventions, PST-PC and DIET, were not designed to specifically target social support. Future research is needed to determine the modifiability of belonging support in older adults with PTSD. Finally, the analytic models tested do not exclude the possibility of a bidirectional relationship. It is possible that participants' perceived sense of belongingness increased as symptoms of depression and associated symptoms of PTSD changed because of their participation in a supportive clinical trial.

In conclusion, a sense of belonging support, or the ability to do activities with others, was the only interpersonal support measure associated with PTSD symptoms among both older Black and White adults. Improvement in belonging support was correlated with a reduction in PTSD symptoms over a 1-year follow-up. These findings were significant even with control for well-established correlates of PTSD including depression, anxiety, and poor sleep quality. We hypothesize that belonging support may reduce symptoms of PTSD by serving as an active coping mechanism to develop a sense of community with others. Thus, interventions to promote belonging support should be tested to directly address whether and how they reduce PTSD in older adults.

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