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BEHAVIORAL-BIO-MEDICAL INTERFACE (JL BROWN AND RJ DICLEMENTE, SECTION EDITORS)

Healthy Aging in Older Women Living with HIV Infection: a Systematic Review of Psychosocial Factors

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Abstract Due to life-enhancing effects of antiretroviral therapy, HIV-positive persons have the potential for long life comparable to their uninfected peers. Older women (age 50+) living with HIV (OWLH) are often an under-recognized aging group. We conducted a systematic review to examine psychosocial factors that impact how OWLH live, cope, and age with HIV. Initial key word search yielded 1527 records, and 21 studies met our inclusion criteria of original quantitative or qualitative research published between 2013 and 2016 with results specific to OWLH. These focused on health care and self-management, sexual health and risk, stigma, loneliness, mental health (depression, substance use), and protective factors (coping, social support, well-being). Due to the scarcity of studies on each topic and inconclusive findings, no clear patterns of results emerged. As the number of OWLH continues to grow, more research, including longitudinal studies, is needed to fully characterize the psychosocial factors that impact aging with HIV.

Keywords HIV/AIDS · Older women · Older adults · Elderly · Psychosocial factors · Sexual health · Mental health · Healthy aging · Healthcare utilization · Protective factors

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Introduction

In 2015, more than half of HIV-positive individuals in the USA were aged 50 or older [1], and this number is expected to rise to 70% by 2020 [2]. With consistent adherence to antiretroviral therapy (ART) and healthcare services, persons living with HIV/AIDS (PLWH) can now expect to live almost as long as their HIV-negative peers [3]. Despite the increase in older women (age 50+) living with HIV (OWLH), little is known about the psychosocial factors that impact how they live, cope, and age with HIV. Unlike social determinants of health, psychosocial factors are viewed as being amenable to change, resulting in decreased transmission and improved health and thus lessening the burden of AIDS among PLWH [4–10]. Factors such as healthcare utilization, sexual health, stigma, isolation, loneliness, depression, and substance use impact adherence to HIV medications and clinical outcomes

in PLWH in general [11–17], but have not been well studied in OWLH. This paper describes a systematic review of the literature on psychosocial factors specific to OWLH. We have broadly defined psychosocial in contrast to biomedical determinants of health as a wide range of variables pertaining to the social context and social psychology as well as their interaction. Our goal was to explore the current state of knowledge, identify the gaps, and make recommendations for future research.

Methods

To identify studies examining behavioral and psychosocial aspects of aging for OWLH, we conducted literature searches in May 2016, using the following electronic databases: PubMed/Medline, Academic Search Complete, ProQuest, and Scopus. Given the paucity of studies among OWLH, we did not exclude any psychosocial domains from our search. Therefore, our focus included but was not limited to the broad topics of health care (utilization, self-management, antiretroviral therapy/adherence), sexual health and risk, psychosocial issues (stigma, loneliness), and mental health. The search terms were constructed using various combinations of the following keywords: aging, elderly, older, women, adults, and HIV/AIDS. Since the search did not return many results pertaining to sexual functioning, we also conducted additional searches using "sexual functioning and HIV" and "female sexual dysfunction and HIV" as our search terms. The search was supplemented by examining bibliographies in the selected articles.

We used the following inclusion criteria: (1) only original research articles; (2) published between 2013 and 2016; (3) psychosocial but not neurocognitive focus; (4) study results pertaining to OWLH; and (5) study sample may be limited to older HIV-positive women or may include both younger and older HIV-positive women or older HIV-positive women and men if there is an explicit discussion of how results differ by gender/age. We did not exclude any research based on study methodology, but, given the focus of this special issue, we excluded at-risk older women and research studies conducted outside of North America.

Results

The outlined search procedure resulted in 1527 records found in different databases based on the above keywords. As a result of the first round of reviews, 1335 records were excluded based on title/abstract or due to duplicates. For the remaining 192 articles, the full-text analysis was conducted, which resulted in 21 studies included in this review. The summary of the reviewed articles is provided in Table 1.

Healthcare Issues

Service Utilization

We found only one study by McDoom et al. [28•] that included OWLH and examined healthcare utilization. The authors qualitatively examined the engagement in HIV care by Black OWLH. Women currently in HIV care were recruited via snowball sampling from a Boston area HIV primary care clinic. Two themes emerged from the qualitative interviews. First, fear, anxiety, or perception of discrimination due to being HIV-positive (i.e., HIV-related stigma) acted as a barrier for women to seek or engage in HIV care. Women feared of being "outed" by seeking care at HIV or infectious disease specialty clinics. In addition, judgmental behavior by medical providers, especially during the earlier years of their HIV infection, led to periods of non-retention in care. Second, women who were well connected and supported by their social environment were able to stay engaged in HIV medical care. Therefore, supportive relationships, such as formal (e.g., healthcare providers, support groups) and informal (e.g., family, friends) help and encouragement, were perceived as conducive to engagement in HIV care. This was especially true for strong family ties that helped to facilitate retention in HIV care but could also derail women when relationships ended, leading to social isolation and non-engagement in care.

HIV and Co-morbidity Management

Self-management of HIV disease and co-morbidities has become more important as many PLWH will experience co-morbidities, such as diabetes, cancer, or heart disease. We found two studies that addressed this subject.

Psaros et al. [29] recruited 19 OWLH from community-based HIV/AIDS service organizations and an Infectious Disease Clinic in Boston, MA. Semi-structured interviews were conducted to capture women's experience with HIV as they are aging. Their findings showed that women used three main strategies to cope successfully with HIV: (1) caring for mind and body by managing stress, depression, and anxiety as well as utilizing social support by family, support groups, and therapists; (2) changing and eliminating negative or "toxic" relationships and environments, such as substance abuse; and (3) engaging in meaningful activities, such as contributing to HIV prevention and awareness.

Warren-Jeanpiere et al. [36] conducted five focus groups in DC with 23 OWLH who were participants in the Women's Interagency HIV Study (WIHS). Similar to Psaros et al. [29], they found that HIV and co-morbid condition self-management strategies included eating well, exercising, adhering to medications, doing good to others and self, and engaging in spiritual activities. Importantly, self-management of co-morbid conditions, such as diabetes and

Table 1 Summary of reviewed articles (2013–2016)

Article	Participants	Study location and design	Findings pertaining to HIV-positive 50+-year-old women
Abara et al. [18]	801 HIV+ older adults (age range 50–64): 440 men and 361 women; Medicaid patients enrolled between January 1, 2005, and December 31, 2007	Multisite—Medicaid claims data from 14 states; timely initiation of ART was measured as a continuous variable in reference to the date of symptomatic HIV or AIDS diagnosis; proportion of prescribed days covered (i.e., pharmacy claims data); univariate and multivariable Cox proportional hazards regression analyses	Gender-specific results pertaining to timely ART initiation: • *Gender differences in timely ART initiation:* No gender-specific differences in time to ART initiation were detected (female—reference; male: HR = 1.05, 95% CI 0.88–1.26; aHR 1.13, 95% CI 0.94–1.37)
Abara et al. [19•]	5177 HIV+ older adults (age range 50–64):3210 men and 1967 women; Medicaid patients enrolled between 01.01.08 and 11.30.09 and received HIV/AIDS diagnosis between 01.01.08 and 11.30.08	Multisite—Medicaid claims data from 29 states; cART was measured as proportion of prescribed days covered (i.e., pharmacy claims data); Bivariate and multivariable Poisson regression analyses	Gender-specific results pertaining to ≥95% ART adherence: • *Gender differences in ART adherence.* (1) 29% of women vs 34% of men were adherent; (2) multivariable regression analyses showed that male participants were significantly more likely to be adherent than females (APR = 1.11, 95% CI 1.02–1.21, $P = 0.0127$)
Brennan et al. [20•]	1103 HIV+ older adults (age range 50–86, mean 57): 117 women, 184 heterosexual men, 726 gay men, 76 bisexual men; participating in the Ontario HIV Treatment Network (OHTN) Cohort Study (OCS)	10 clinical sites in Ontario, Canada; cross-sectional—interviewer-administered questionnaires, including sociodemographic and sociobehavioral questions; Descriptive statistics, chi-square and *t* tests, ANOVA analyses (NB: analysis of psychosocial variables was limited to a subsample of 460 participants)	The study describes sociodemographic characteristics of a sample of older adults. ANOVA analyses showed the following gender differences in psychosocial variables: • *Stigma.* Women and heterosexual men had higher overall and subscale stigma scores as compared to MSM ($p < .001$) • *Depression.* Women had higher CES-D total and affective scores than men ($p < .001$) • *Social support.* Women and gay men had higher mean levels of emotional-informational social support on MOS social support scale compared to straight and bisexual men. • *Coping.* "Gay and bisexual men had significantly lower mean maladaptive coping scores based on the brief COPE scale compared to women and heterosexual men ($p < .001$)"
Cederbaum et al. [21]	46 HIV+ women (age range 27 to 65)	Los Angeles, CA; Cross-sectional–interviewer administered survey; Descriptive analysis and OLS multivariate models	The study examined the effects of age on the following: • *Stigma.* No relationship between age and personal stigma • *Social support.* Positive relationship between age and friend support (b=0.27, ($p < .005$) • *Depression.* No relationship between age and depression
DeGrezia and Scrandis [22]	40 HIV+ older adults (age range 50–69, mean 56): 17 men and 23 women	Unspecified urban location; Qualitative design—participant observation, individual interviews, single-gender focus groups; Qualitative content analysis	The study identified key stressors and coping strategies, including discussion of gender differences: • *Stressors* included HIV and co-morbidities, anger towards partner who transmitted HIV, abuse, poverty, and financial strain. • *Coping strategies:* (1) accessing support; (2) helping selves and helping others; (3) tapping into spirituality
Emlet et al. [23]	405 HIV+ adults aged 50+ (mean age 57): 44 women, 50 heterosexual men, 311 MSM; participating in Ontario HIV Treatment Network (OHTN)	Ontario, Canada; Cross-sectional—study participants complete survey with sociodemographic and sociobehavioral questions;	The study provided gender-specific results concerning HIV-related stigma: • *Overall HIV stigma score.* In regression analyses, as compared to MSM, both women (b = 4.72, $p < 0.05$) and heterosexual men (b = 4.06, $p < 0.05$) had higher perception of overall HIV stigma

Table 1 (continued)

Article	Participants	Study location and design	Findings pertaining to HIV-positive 50+-year-old women
		Descriptive analysis and OLS multivariate models	• *HIV stigma subscales.* As compared to MSM, women have higher scores only on anticipated and internalized subscales, and men—on anticipated subscale only
Golub et al. [24•]	328 HIV+ older adults (age range 50–65+): 71 women, 88 MSM, 169 heterosexual men participating in the Research on Older Adults with HIV project (ROAH) project and self-reporting ≥1 episode of vaginal/anal sex in the past 90 days	New York, NY; Cross-sectional—self-administered pen-and-paper questionnaires; Pearson chi-squared tests, MANOVA, and multivariate logistic regression analyses	Gender-specific results were related to protected sex practice and the effects of well-being on protected sexual activity: • *Sexual risk behaviors.* (1) MSM were significantly more likely to report using drugs during sex (60.2%), compared to straight males (40.2%) and females (35.4%); (2) "First order logistic regression analysis showed that using drugs or alcohol while engaging in anal/vaginal sex was negatively associated with practicing protected sex for straight male participants (OR = 0.37; $p \leq .003$) and females (OR = 0.28; $p \leq .018$), but not for gay/bisexual males (OR = 1.38; $p = .481$)." • *Effects of well-being.* AIDS diagnosis reduced the odds of safe sex for women, having purpose in life, environmental mastery, and autonomy increased the odds of safe sex
Grodensky et al. [25]	15 HIV+ older (age range 50–79, mean 57) African American and White women recruited from an HIV care clinic	Unspecified location in Southeastern USA; Qualitative design—in-depth, semi-structured interviews on psychosocial aspects of women's lives related to HIV diagnosis and management; Qualitative content analysis	The study has results related to women's sources of and barriers to social support as well as sexual activity: • *Social support.* (1) Women received social support mostly through family and friends rather than romantic relationships. Spirituality and church activities provided great support for all participants, even though most did not disclose their HIV status in church. (2) Fear of disclosure emerged as the main barrier to social support. • *Sexual activity.* Most women were not sexually active due to the following reasons: "fear of infecting others, fear of being rejected, lack of available men, and low prioritization of having sexual intercourse" and the fear of stigma connected to disclosure, also lack of sexual desire
Mannes et al. [26]	96 HIV+ African American 50+ adults (mean age 55.77): 36 men and 60 women	Jacksonville, FL; Cross-sectional—interviewer-administered assessment on mental and behavioral health; Pearson correlations and binary logistic regression analyses stratified by gender	Regression analyses stratified by gender examined the relationship between loneliness and substance use: • *Effect of loneliness on substance use.* For women, loneliness was associated with illicit drug use (AOR = 3.37, $p = 0.018$) and heavy drinking (AOR = 2.47, $p = 0.033$). No significant association was found for men
McCoy et al. [27]	309 men and 117 women; participating in the PRIME study between 2007 and 2012 (telephone-delivered ART adherence and quality-of-life intervention)	Community-based AIDS Service Organizations from 9 states (Arizona, California, Illinois, Massachusetts, Michigan, Pennsylvania, Texas, Washington and Wisconsin); Secondary cross-sectional data analysis—self-report questionnaires; Spearman correlational and logistic regression analysis	Gender-specific results pertaining to ≥95% ART adherence: • *Gender differences in ART adherence.* (1) The overall mean ART adherence in this cohort was 88% (89% for women); using the Golin Self-Report of Medication Non-Adherence questionnaire (HIV medications missed over the last 30 days); (2) Logistic regression analyses showed that gender was not significantly associated with ART adherence ($p = 0.74$)
McDoom et al. [28]			

Table 1 (continued)

Article	Participants	Study location and design	Findings pertaining to HIV-positive 50+-year-old women
	20 HIV-positive 50+ Black Women currently in HIV care; recruited from HIV primary care clinic and through snowball sampling	Metropolitan Boston area; Qualitative design—semi-structured interviews focusing on social support and experiences of stigma and their impact on engagement in HIV care; Systematic content analysis informed by grounded theory	Engagement in care experiences in this included (1) attending appointments; (2) missing appointments; (3) interactions with medical providers. Two primary themes emerged in relation to engagement in care among older women living with HIV: • *The role of stigma:* (1) Women feared of being "outed" by seeking care at clinics associated with HIV or infectious disease care; (2) judgmental behavior by medical providers has led to non-engagement in care, especially during earlier years of the epidemic. • *The role of social connections:* (1) Experiences with HIV disclosure impact women's confidence to stay in care; (2) formal and informal sources of support were conducive for engagement in care; (3) strong supportive family ties facilitated engagement in care; (4) stressful life events negatively impacted engagement in care
Psaros et al. [29]	19 HIV ≥50-year-old (mean 57 years) women, recruited from community HIV/AIDS service organizations + Infectious Disease Clinic including ongoing screening for RCT testing cognitive behavioral therapy for ART adherence and depression treatment; convenience sample	Boston, MA; Qualitative design—semi-structured interviews capturing women's experiences with HIV as they age; Content analysis using grounded theory approach	Management of health was assessed using the following questions: (1) "How would you describe your overall health?"; (2) "What health problems are you having?" Themes related to HIV and co-morbidities management included: • *Caring for mind and body:* (1) managing stress, depression, and anxiety was considered a key strategy to promote wellness; (2) participants utilized various strategies, such as therapy, support groups, and family members to optimize their emotional well-being. • *Changing or eliminating negative relationships and environments:* (1) giving up "toxic" relationships; (2) giving up "toxic" behavior such as substance abuse. • *Engaging in meaningful activities:* (1) contributing to HIV prevention and awareness; (2) helping newly diagnosed individuals through peer navigation
Siconolfi et al. [30]	811 HIV+ 50+ adults (mean age 55.67): 208 women, 364 heterosexual men, 239 MSM; participating in the ROAH project	New York, NY; Cross-sectional—self-administered pen-and-paper questionnaires; Descriptive statistics, chi-square tests, ANOVAs with Bonferroni correction	The study examined associations between demographics, mental health, and substance use. Gender-specific results pertained to depression, loneliness, well-being, and drug use: • *Gender differences in psychological states.* (1) No significant gender differences were found in depression scores; (2) "Heterosexual men reported higher loneliness than heterosexual women and gay/bisexual men ($F(2, 801) = 7.02$, $p = .001$)." (3) "Heterosexual women reported higher self-acceptance than heterosexual men $F(2, 794) = 4.66$, $p = .01$; higher positive relations with others than heterosexual men $F(2, 793) = 10.18$, $p < .001$; higher purpose in life than heterosexual men and gay/bisexual men $F(2, 793) = 8.58$, $p < .001$, and finally, higher environmental

Table 1 (continued)

Article	Participants	Study location and design	Findings pertaining to HIV-positive 50+-year-old women
			mastery than heterosexual men and gay/bisexual men $F(2, 794) = 5.86$, $p = .003$)" • *Gender differences in substance use.* Chi-square tests showed significant differences in substance use. Women had lower prevalence of drinking and drug use than heterosexual men and MSM; women had lower prevalence of smoking than heterosexual men but higher than MSM
Siemon et al. [31]	20 HIV+ 50+ women (median age 53.5) recruited from ASOs and HIV clinics	Southern Ontario and Nova Scotia, Canada; Maximum variation sampling; Qualitative design—semi-structured face-to-face or telephone interviews; Qualitative analysis using a constructivist grounded theory approach	Women experienced social participation as a dynamic process impacted by contextual factors and involving both engagement and isolation: • *Social engagement.* (1) connecting with people; (2) connecting through spirituality; (3) connecting through volunteer work. • *Social isolation.* Because of (1) lacking a desire to be with others;(2) body image issues; (3) barriers to employment. • *Stigma.* Contextual factor hindering social engagement. Stigma due to (1) gender/sexuality; (2) HIV; (3) culture.
Skalski et al. [32]	301 HIV+ older adults (range 50–76, mean 55.5): 202 men and 99 women; recruited from ASOs; with depressive symptomatology and enrolled in a randomized controlled trial of coping group intervention to reduce depressive symptoms	New York, NY, Columbus, OH, Cincinnati, OH; Cross-sectional—data from baseline assessment collected through ACASI; Descriptive statistics, chi-square tests and *t* tests, bivariate and multivariate logistic regression analyses	The study examined relationship between coping styles and illicit drug use. Gender-specific results concerned illicit drug use: • *Gender differences in drug use.* Male gender as compared to female gender increased the odds of drug use in the unadjusted (OR = 2.93) but not in the adjusted analyses
Storholm et al. [33]	904 HIV+ older adults (range 50–78, median age 54): 640 men and 264 women; participating in ROAH project	New York, NY; Cross-sectional—self-administered pen-and-paper questionnaires; Descriptive statistics, chi-square tests and *t* tests, correlation analyses, mediation analyses	Study examined the mediating role of stigma between multiple-minority status and mental health burden. • *Gender differences in perceived stigma.* No significant gender differences in perceived HIV-related stigma. • *Gender differences in multiple minority status.* Women reported significantly fewer minority statuses than men. • *Gender differences in mental health.* (1) No significant gender differences for loneliness and depression; (2) women reported significantly lower total mental health burden than men; (3) HIV-stigma mediated relationship between minority status and mental health burden for the total population and men but not for women
Taylor et al. [34]	1921 HIV+ and 742 HIV− women 18 to 60+; participants in WIHS	Multisite—Washington, DC; San Francisco, CA Bay Area; Los Angeles, CA; Brooklyn, NY; Bronx, NY; and Chicago, IL; Longitudinal observational study—interviewer-administered assessments and physical exams;	Study assessed the impact of age on sexual activity (SA) and unprotected anal and vaginal intercourse (UAVI): • *Sexual activity.* "For every 10-year age change, the odds of any SA declined by 62% for HIV+/detectable women, 64% for HIV+/undetectable women, and 62% for HIV− women. Differences in SA among virologic groups in terms of age effect were statistically non-significant ($F[2, 8858] = 0.37$, $p = 0.693$)."

Table 1 (continued)

Article	Participants	Study location and design	Findings pertaining to HIV-positive 50+-year-old women
		Descriptive statistics, logistic regression models, generalized mixed linear models	• *Sexual risk behaviors*. "The odds of UAVI declined by 17% for HIV+/detectable women, 9% for HIV+/undetectable women, and 4% for HIV-uninfected women per decade of age. The decline was only statistically significant for the HIV+/detectable women. Differences among virologic groups in age effect are statistically significant (F[2, 7490] = 3.33, p = 0.036).
Taylor et al. [35]	50 HIV+ women aged 50–69; recruited from WIHS study and Brooklyn HIV clinic	Multisite—Brooklyn, NY; Bronx, NY; and Chicago, IL; Qualitative design—41 one-time, in-depth, individual interviews; 8 focus group discussions; Thematic analysis guided by biopsychosocial and the sexual health framework	Identified several salient themes: • *Sexual activity and sexual functioning.* Sexual pleasure and the need for intimacy continue to be important for OWLH but changing sexual abilities and sexual health needs, such as the reduction of sexual desire, as well as increased painful intercourse due to menopause-associated vaginal drying, are persistent barriers to sexual fulfillment and satisfaction. • *Sexual risk behaviors.* The interpersonal dynamics, including low perceptions of the risk of HIV transmission as related to gender, viral suppression, and habitual condomless sex with long-term partners without HIV transmission, result in abandoning safer sex practices with serodiscordant partners
Warren-Jeanpiere et al. [36]	23 HIV+, 50+-year-old (range 52–65, mean 57) African American women participating in the Women's Interagency HIV Study (WIHS)	Washington, DC; Purposive sampling; Qualitative design: 5 focus groups; Constant comparison approach to data analysis	3 themes emerged in relation to HIV and co-morbidity management: • *"Taking it one day at a time."* The meaning of HIV self-management includes adherence, eating well, exercising, doing good to others and self, engaging in spiritual activities. • *"Age ain't nothing but a number."* Women did not have expectations of growing older because of HIV and did not self-identify as being older; they defined age as a state of mind as opposed of chronological number. • *"Forget the single life."* Women emphasized the importance of intimate partner
Whitehead, Hearn, and Burrell [37]	95 HIV+, 50+-year-old African American adults (range 50–76, mean 55.74): 60 women and 35 men recruited through the University of Florida Center for HIV/AIDS Research, Education and Service (UF CARES)	Jacksonville, FL; Cross-sectional—interviewer-administered assessment on mental and behavioral health functioning, urine sample, medical chart review; t tests, Pearson correlations, hierarchical linear regressions	The study examined the relationship between depressive symptoms and trait anger on perceived social support and whether life stressors moderated this relationship. • *Gender effects on perceived social support.* Gender was included in the overall model but was not a significant predictor of perceived support
Williams et al. [38]	447 HIV+ 50+ adults: 125 women and 322 men; recruited from ASOs; on ART and reporting suboptimal adherence; participants in the Self-Managing HIV and Chronic Disease (PRIME) randomized controlled trial	Multisite—9 states; Cross-sectional—baseline telephone survey; Descriptive statistics, chi-square tests	The study examined alcohol use by sociodemographic characteristics. • *Gender differences in alcohol use.* "Participants reporting no drinking in the past year were more likely to be female, heterosexual, and report ever use of injection drugs than drinkers"

hypertension, was perceived to be more difficult than HIV. The study also examined women's representations of and plans for the old age. Despite research suggesting that HIV/AIDS may accelerate aging, women did not have expectations of growing older because of their HIV infection. Age was not seen as a chronological number, but rather a state of mind. In relation to growing older while living with HIV, women emphasized the importance of having an intimate partner who would provide support when needed.

ART Timely Initiation and Adherence

ART adherence, as well as timely initiation, has been shown to be vital to increasing the life expectancy and decreasing mortality among PLWH. Three quantitative studies using secondary data from intervention trials and Medicaid claim data have examined gender differences with regards to ART initiation and adherence among older PLWH. McCoy et al. [27] used self-report ART adherence data from various states across the USA to evaluate gender difference in ART adherence among 309 older (50+) men living with HIV (OMLH) and 117 OWLH—no significant difference in ART adherence by gender was found. Abara et al. [18, 19•] used Medicaid claim data for evaluating gender differences in ART adherence and time to ART initiation. While OWLH were significantly less likely to adhere to their ART therapy than OMLH ($p = 0.0127$) [19•], no gender difference regarding time to ART initiation was found [18].

Sexual Health

Sexual Activity and Sexual Functioning

Four of the reviewed studies examined sexual activity (SA) or sexual functioning among OWLH. In a longitudinal analysis using data from WIHS, Taylor et al. [34] examined the impact of age on self-reported SA over a 13-year period in a national sample of 1927 HIV-positive and 742 HIV-negative women aged from 18 to 60+. The results show that for every age group, including 50+, HIV-positive women report lower levels of SA than HIV-negative women but the rate of decline of SA with age is similar among different virologic groups. Thus, the odds of SA declined by 62–64% per decade of age for both HIV-positive and HIV-negative women. The onset of menopause, however, had statistically significant effect only for HIV-positive women and resulted in 18–22% decline in the odds of SA.

Several qualitative studies provide additional insight on sexual activity among OWLH, including important understandings into unique barriers to physical intimacy and rationales for celibacy and abstinence. Grodensky et al. [25] interviewed 15 OWLH to explore their experiences living with HIV and found that only four participants reported SA. Those participants without sexual partners either had ended past relationships by choice or were abandoned, or their partner died. They also found that women who were averse to entering into new relationships did so because of their fear of transmitting HIV to others and of being rejected, the belief that there is a lack of available men, and their low interest or desire in having sexual intercourse. Warren-Jeanpiere et al. [36], on the other hand, found that many participants had or desired intimate partners and believed that having intimate or romantic relationships inspired them to have a positive outlook on the future and to more effectively manage their HIV and other co-morbid conditions. Taylor et al. [35] conducted 8 focus groups and 41 in-depth interviews with 50 Black and Latina OWLH in three US cities to examine the importance of sex and sexuality in their lives. They found that sexual pleasure and the need for intimacy continued to be important for OWLH, and many reported that sexual pleasure improved with age as they felt free from worry about pregnancy or taking care of others. This study was the only one that presented results pertaining to OWLH sexual functioning—i.e., women's changing sexual abilities and sexual health needs, such as the reduction of sexual desire, as well as increased painful intercourse due to menopause-associated vaginal drying, were persistent barriers to sexual satisfaction.

Sexual Risk Behaviors

We found only three studies that examined sexual risk behaviors among OWLH. Golub et al. [24•] used a sample of 328 sexually active older PLWH (71 of them women), who completed a cross-sectional survey in New York City within the Research on Older Adults with HIV (ROAH) project. Although there was no significant difference in the percentages of women, heterosexual men, and gay/bisexual men who reported unprotected anal/vaginal sex within the last 3 months (40.8, 37.3, and 51.1%, respectively), there was a significantly lower percentage of women (35%) who reported using substances when having sex. They also found that psychological well-being was positively associated with consistent condom use during every act of anal or vaginal sex but differed according to gender and sexual orientation. Protected sex practices for OWLH was positively associated with purpose in life (OR = 2.22; $p = .012$), environmental mastery (OR = 2.16; $p = .013$), and autonomy (OR = 1.99; $p = .026$).

Taylor et al. [34] found that levels of unprotected anal and vaginal intercourse (UAVI) declined over 13 years of follow-up, although HIV-negative women reported significantly ($p < 0.0001$) more UAVI than HIV-positive/detectable or HIV-positive/undetectable women (54, 25, and 22%, respectively). In logistic regression analysis, they found the odds of UAVI declining by 17% for HIV-positive/detectable women,

9% for HIV-positive/undetectable women, and 6% for HIV-negative women per decade of age. The decline was statistically significant for the HIV-positive/detectable women. Differences among virologic groups in age effect were statistically significant ($p = 0.036$). Additionally, the onset of menopause resulted in a statistically significant decline in the odds of UAVI, but only for HIV-positive/detectable women.

Finally, a qualitative study by Taylor et al. [35] found that interpersonal factors, including low perceptions of the risk of HIV transmission, viral suppression, and habitual condomless sex with long-term partners without HIV transmission, resulted in some OWLH abandoning safer sex practices with serodiscordant partners.

Psychosocial Issues and Protective Factors

Stigma

We found six studies that reported results pertaining to stigma and met our inclusion criteria. Four studies examined gender or age differences in stigma perception. Storholm et al. [33] analyzed data obtained from ROAH participants—640 OMLH and 264 OWLH. Among other factors, this study assessed HIV-related stigma using Berger's Stigma Scale [39] and found no significant gender differences. However, Emlet et al. [23] and Brennan et al. [20•] compared HIV-related stigma perception of OWLH, heterosexual OMLH, and gay/bisexual OMLH, using subsamples of the Ontario HIV Treatment Network (OHTN) Cohort Study (OCS). They found that, as compared to men who have sex with men (MSM), both women and heterosexual men had higher stigma scores based on modified Berger's Stigma Scale [40]. Lastly, a study among a convenience sample of 46 HIV-positive women aged 27 to 65 years by Cederbaum et al. [21] reported that, in multivariate regression models, age had no statistically significant effects on either personal stigma or disclosure fears as measured by Berger's Stigma Scale.

Several articles reported gender-specific results related to the effects of stigma. Storholm et al. [33] found HIV-related stigma to mediate the relationship between total minority status and total mental health burden for the whole sample and for men but not for women. McDoom et al. [28•] suggested that HIV-related stigma, and especially stigma by medical providers, resulted in decreased engagement in HIV care. Siemon et al. [31] linked stigma to loneliness and decreased social participation. Based on semi-structured interviews with 20 OWLH, they found that participants experienced stigmatizing and discriminatory actions not only due to their HIV status but also due to the fact that they did not conform to the society's stereotypes of an HIV-positive person to be predominantly young (age-related stigma) and male or MSM (gender and sexual orientation stigma). Because of these stereotypes, there are few support services and resources designed for OWLH, which results in their reduced social participation and loneliness.

Social Isolation and Loneliness

We found four publications considering loneliness—one of them exploring barriers to social engagement and participation, and three dealing with gender differences. Two studies reported no gender differences in loneliness, using the UCLA 20-item loneliness scale [41]. Storholm et al. [33] found that 28.1% of women in the sample experienced loneliness as opposed to 33.6% of men. Their chi-square analyses of the dichotomized loneliness scores showed no statistically significant gender differences. These results were supported by Mannes et al. [26] who examined the association between loneliness, depression, and substance use for older African American PLWH—36 men and 60 women. This study also found no significant gender difference on average loneliness scores. However, in a study of psychosocial and demographic correlates of drug use among 208 OWLH and 603 OMLH, Siconolfi et al. [30] found that heterosexual men reported higher loneliness than heterosexual women and MSM based on ANOVA analyses ($F(2, 801) = 7.02$, $p = .001$).

One of these studies also reported the effects of loneliness, while another examined its antecedents. Mannes et al. [26] found that loneliness was significantly associated with heavy drinking in OWLH (AOR = 2.47, $p = .033$) but not in OMLH. Similarly, in difference to men, lonely women reported higher odds of marijuana use (AOR = 2.96, $p = .047$) and illicit drug use (AOR = 3.37, $p = 0.18$). An analysis by Siemon et al. [31] suggested that social isolation was an outcome of various experienced stigmas. This study also uncovered additional reasons for social isolation, including body image and mental health issues, as well as the barriers to employment.

Mental Health Challenges

This section focuses on mental health challenges—depression, stress, mental health burden, and substance abuse. A publication by DeGrezia and Scrandis [22] provides a qualitative description of stressors salient in the lives of 17 OMLH and 23 OWLH. Even though this study reported several major stressors without reference to gender—e.g., anger towards their infecting partners, struggle with multiple co-morbidities, having experienced one or more forms of abuse—other stressors were more gender-specific. Whereas financial concerns were a source of stress primarily for men, it was mostly women who reported constant caring for family members as being a stressor that took its toll on their health.

Three of the reviewed studies reported results pertaining to depression. Siconolfi et al. [30] and Storholm et al. [33]

conducted research on the same sample of ROAH participants, measured depression on the CES-D scale [42], and found no significant gender differences. However, Brennan et al. [20•] used a large sample of OCS study participants and reported that OWLH had higher CES-D total and affective scores than OMLH ($p < .001$). Cederbaum et al. [21], on the other hand, considered the effects of HIV-positive women's age on depression and reported no statistically significant results. A study by Storholm et al. [33] additionally examined an overall mental health burden, operationalized as a summary measure for loneliness, depression, and the lack of well-being, and found that the total mental health burden was significantly higher for OMLH (M = 3.81, SD = 2.76) than for OWLH (M = 3.12, SD = 2.62).

Lastly, four of the reviewed studies had results related to substance use. These studies suggest that, in general, OWLH are less likely to use substance than OMLH. Williams et al. [38] used a sample of 322 OMLH and 125 OWLH to examine sociodemographic characteristics associated with alcohol use and found that participants who reported no drinking in the past year were significantly more likely to be female. However, among those participants who reported any past year drinking, there was no significant gender difference in alcohol use severity. The effects of gender on drug use were examined by Skalski et al. [32] who recruited 301 older PLWH (99 females) with depressive symptomatology. This study reported that, as compared to female, male gender increased the odds of illicit drug use in the past 60 days in the unadjusted (OR = 2.93, $p < 0.01$) but not in the adjusted analyses. An earlier mentioned study by Siconolfi et al. [30] also found significantly lower percentage of drinking, drug use, and smoking in the past 3 days among OWLH than heterosexual OMLH.

Protective Factors

Coping, resilience, and hardiness have emerged among the key variables in the literature on protective factors for PLWH [43, 44]. Even though we did not find any studies on resilience and hardiness that met our inclusion criteria, there were two articles examining coping strategies. Similar themes for coping strategies, such as accessing social support, helping self and others through HIV education and activism, and finding meaning, either through volunteering or religion, emerged in earlier reviewed studies by Psaros et al. [29] and DeGrezia and Scrandis [22]. Additionally, Brennan et al. [20•] found that OWLH and heterosexual OMLH had significantly ($p < .001$) higher mean maladaptive coping scores as compared to gay/bisexual OMLH.

Four studies focused specifically on social support, and two out of these four studies also examined spirituality. Grodensky et al. [25] described family (especially daughters) and platonic relationships as the main sources of social support. Spirituality and private relationship with God also emerged as an important coping strategy, even though women did not rely much on church for social support and rarely disclosed their HIV status within their congregations. A similar description of spirituality as important but private rather than social was provided by Siemon et al. [31] who also specified friends and family as well as volunteer work as major sources of social engagement and support. Brennan et al. [20•] examined gender and sexual orientation differences in perceived social support and found that OWLH and gay OMLH had higher mean levels of emotional-informational social support as compared to straight and bisexual OMLH. Whitehead, Hearn and Burrell [37] tested a hypothesis that perceived social support is a function of depressive symptoms on a sample of 95 older PLWH (63% women). They found that, while this relationship was supported, gender did not have a significant effect on perceived support.

Lastly, two other studies based on ROAH participants explored well-being as measured by six Ryff subscales [45]. Siconolfi et al. [30] found that heterosexual OWLH reported higher self-acceptance and higher positive relations with others than heterosexual OMLH; women also showed higher purpose in life and environmental mastery than both heterosexual men and MSM. Golub et al. [24•], on the other hand, examined the effects of well-being and found that higher well-being was associated with practicing protected sex for both OWLH and OMLH, but the relevant subscales differed for each group.

Discussion

There is an emerging body of literature that describes unique psychosocial factors related to OWLH. There is also a need for more research aimed specifically at this population [43, 46]. Although our review found 21 studies that were conducted in 2013–2016 and made significant contributions to this evolving field, many gaps still remain. Even though many studies made comparisons between OWLH and OMLH or between older and younger HIV-positive women, we found little research examining age-related differences stemming from women's race/ethnicity, socioeconomic status, sexual identity, and urban or rural location. Also, most of the quantitative studies used relatively small convenience samples and may not be generalizable. Lastly, one of the most important gaps uncovered by this review is the lack of longitudinal studies, with the exception of Taylor et al. [34] and some research predating the publications included in this review e.g., [47–49]. This underscores the importance and an untapped potential of national cohort studies that are aging, such as WIHS or OCS. Below, we provide a more detailed discussion of our findings.

Even though healthcare utilization has been shown to be a critical factor for achieving optimal health outcomes, we found only one study that examined barriers to healthcare

utilization among OWLH [28•] and this study only focused on Black women. Other studies that explored healthcare issues dealt with HIV and co-morbidity management [29, 36] as well as ART medication initiation and adherence [18, 19, 27]. Results were conflicting about gender differences, with one study showing that women had poorer adherence than men [19•].

With regards to sexual health among OWLH, the studies reviewed above as well as earlier existing research suggest that, even though OWLH experience age-related declines in SA similarly to HIV-negative women [34] and the general population [50], they continue being sexually active. However, the levels of SA for OWLH appear to be lower than those for both older HIV-negative women and HIV-positive men [34, 51, 52]. The reasons for that are not well understood and need to be addressed by future research. The studies also show that some OWLH continue engaging in sexual risk behaviors, although the likelihood decreases with age [34, 47, 51]. This indicates the need for sexual health interventions aimed specifically at OWLH. With rare exceptions [e.g., 35, 49], there is also a paucity of research on sexual functioning among OWLH, even though there are studies in younger HIV-positive women [53–55]. Further studies are needed to examine psychosocial determinants of sexual functioning, SA, and sexual risk behaviors in OWLH.

Many of the reviewed studies examined psychosocial issues and protective factors in OWLH. Collectively, this and previously existing research show that non-trivial numbers of OWLH suffer from multiple types of stigma, loneliness, stress, depression, and substance use; however, with the exception of substance use, the research is less conclusive as to whether these issues have different prevalence in OWLH as compared to OMLH, younger HIV-positive women, or older HIV-negative women. Moreover, many of the reviewed studies used relatively small convenience samples, were limited to a single geographic location, and may not be generalizable. Further nationally representative large-scale studies are needed to examine prevalence of psychosocial issues among OWLH and make comparisons to other relevant population groups.

We found several studies that examined complex interrelationships among various psychosocial factors for OWLH. For example, research links HIV-related stigma to loneliness as well as decreased social participation and utilization of services [28•, 31, 56]. In turn, loneliness has been linked to increased substance use among OWLH [26]. Yet, despite the fact that loneliness has been connected to overall poorer health outcomes among various population groups [57, 58], we found no studies that examined the effects of loneliness (or other psychosocial issues) on health outcomes specifically for OWLH. Overall, there is a paucity of research, and especially longitudinal studies, examining either the determinants or effects of psychosocial issues among OWLH. There is a similar scarcity of studies examining specific mental health challenges—while some deal with stress and/or depression [20•, 22, 33] and substance use [26, 30, 32, 38], we found the lack of research on other disorders, such as anxiety or PTSD.

Our review uncovered even more conspicuous gaps when it comes to protective factors. The reviewed studies focused on coping strategies [22, 29], social support [25, 31], well-being [24•, 30], and spirituality [25, 31]. Even though research exists that points to the protective role of social networks [59–62], we found no studies conducted since 2013 that examined the social networks of OWLH in North American settings. There were no studies of resilience or hardiness that met our inclusion criteria, despite the literature that suggests their importance as protective factors [43, 63]. We also found no intervention research designed for OWLH and meeting our inclusion criteria, although there are some behavioral interventions targeted towards older PLWH [64–71]. Lastly, healthy or successful aging with HIV has been identified as one of key interest areas by the NIH Working Group on HIV and Aging [1]. However, only a handful of studies exist to date that assess psychosocial aspects of successful aging in PLWH [72–75] and none of them focused specifically on OWLH.

Conclusion

Research on psychosocial factors that impact aging in OWLH is emerging. Results of the few studies that met our review criteria on health care, sexual health, stigma, isolation, loneliness, mental health, and protective factors are often conflicting, and no clear patterns emerged. More research, including longitudinal studies, is needed as this group continues to grow. Longitudinal cohorts, such as WIHS, provide a nationally representative sample of women aging with HIV/AIDS and are more likely to have sufficient power to show truly significant results.

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Compliance with Ethical Standards

Conflict of Interest Anna A. Rubtsova, Tonya Taylor, Deborah Konkle-Parker, and Marcia McDonnell Holstad report no conflict of interest.

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