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Personality profiles and health behaviors among sexual minority middle-aged and older adults: Identifying resilience through latent profile analysis

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ABSTRACT

Resilience has been defined as a personality characteristic that promotes adaptation when facing hardships. Research has found evidence of resilience in sexual minority (SM; i.e., lesbian, gay, bisexual) adults, despite facing additional stressors such as discrimination and victimization. Yet, very limited research has been conducted on resilience in this marginalized community. Utilizing data from the Midlife in the United States study, this study conducted latent profile analysis using the Big Five personality traits (i.e., openness, conscientiousness, extraversion, agreeableness, neuroticism) to identify distinct personality profiles in a sample of SM ($n = 159$) and propensity-score matched heterosexual ($n = 318$) middle-aged and older adults. Additionally, the associations between the personality profiles and health-risk/promoting behaviors were assessed. Four profiles were identified: Average (35.2 %), Resilient (47 %), Overcontrolled (7.3 %), and Undercontrolled (10.5 %). The results found that Resilient SM participants were significantly more likely to engage in problematic drinking but were also more likely to have a routine physical exam than Resilient heterosexual participants. Participants with a Resilient profile were more likely to engage in moderate physical activity than other personality profiles for both SM and heterosexual participants. These results suggest that SM adults have the potential for resilience which is often overlooked in research.

1. Introduction

The health of sexual minority (SM; i.e., lesbian, gay, and bisexual) individuals was first identified as a public health priority in the United States by Healthy People 2020 (US Department of Health and Human Services, 2011). While research has found a higher risk of poor health in SM older adults, there is also evidence of resilience in this marginalized community (Fredriksen-Goldsen, Kim, Shui, & Bryan, 2017; Nelson & Andel, 2020). However, there is limited research on resilience in SM middle-aged and older adults. Resilience, commonly conceptualized as an innate trait in research (Chmitorz et al., 2018), has been defined as a personality characteristic that promotes adaptation when facing hardships (Wagnild & Young, 1993). Gaining a better understanding of resilience in SM adults may help identify individuals who have a higher risk of negative health outcomes. The purpose of this study was to examine the associations between resilience and health behaviors in SM

older adults by using latent profile analysis (LPA) to identify a resilient personality profile.

1.1. Conceptual framework

The Health Equity Promotion Model (Fredriksen-Goldsen, Simoni, et al., 2014) factors in the potential for resilience in SM adults by incorporating social positions (e.g., race, age, gender), multilevel context (individual/structural and environmental), and health-promoting and adverse pathways as intersecting influences on sexual and gender minority health outcomes across the life course. According to the Health Equity Promotion Model, health-risk and health-promoting behaviors such as smoking or preventative care can influence the association between minority stress and health outcomes. Fredriksen-Goldsen, Kim, Bryan, et al. (2017) identified resilient pathways from good mental health to good physical health, including

Abbreviations: SM, sexual minority; LPA, latent profile analysis; MIDUS, Midlife in the United States.

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pathways through health-risk and health-promoting behaviors.

1.2. Health-risk and health-promoting behaviors in SM older adults

Compared to heterosexual older adults, SM older adults are more likely to engage in health-risk behaviors like smoking (Blosnich et al., 2014; Fredriksen-Goldsen et al., 2012; Fredriksen-Goldsen et al., 2013), excessive drinking (Fredriksen-Goldsen et al., 2013; Fredriksen-Goldsen, Kim, Shui, & Bryan, 2017), and illicit drug use (Conron et al., 2010). Some studies have also found that younger SM adults are more likely to engage in moderate physical activity than their heterosexual counterparts (Boehmer et al., 2012); however, SM older adults had increased odds of insufficient exercise (Dilley et al., 2010) or were not significantly different in physical activity compared to heterosexual older adults (Boehmer et al., 2012). Studies have also found lower rates of healthcare utilization in SM individuals, despite higher rates of poorer health (Blosnich et al., 2014; Fredriksen-Goldsen et al., 2012).

1.3. A person-centered approach to personality

Personality is defined as a stable set of individual traits that result in relatively stable patterns of thinking, feeling, and behaving (Roberts et al., 2008). Research on personality traits has predominantly focused on variable-centered approaches that examine traits individually (e.g., Big Five: openness, conscientiousness, extraversion, agreeableness, neuroticism); however, personality traits do not occur in isolation (Allport, 1937). A person-centered approach to personality examines unique combinations of personality traits, or personality profiles, that are commonly found in individuals (Yin et al., 2021). Three replicable personality profiles have been found using the Big Five personality traits: Resilient, Overcontrolled, and Undercontrolled (Block & Block, 1980; Kinnunen et al., 2012; Morgan et al., 2017; Yin et al., 2021; Zhang et al., 2015).

1.4. Personality profiles and their associations with health behaviors

The Resilient profile, also labeled as protective or highly adaptive (Yin et al., 2021), is typically identified by being low in neuroticism and high in the other four traits (Ferguson & Hull, 2018; Kinnunen et al., 2012; Morgan et al., 2017; Zhang et al., 2015). The Resilient profile is associated with better physical (Kinnunen et al., 2012) and mental health (Morgan et al., 2017). Lower neuroticism and higher conscientiousness are associated with a higher likelihood of smoking cessation or smoking abstinence (Hakulinen, Hintsanen, et al., 2015). Higher openness and conscientiousness and lower neuroticism are associated with higher levels of physical activity (Wilson & Dishman, 2015). In addition, the Resilient profile is also high in agreeableness which is associated with a higher probability of not drinking as well as with transitioning from moderate alcohol use to abstinence (Hakulinen, Elovainio, et al., 2015).

An Overcontrolled profile, also labeled as brittle or anti-resilient, is typically identified as being high in neuroticism and low in the other four traits (Herzberg & Roth, 2006; Yin et al., 2021; Zhang et al., 2015). Higher neuroticism is associated with health-risk behaviors like smoking and excessive drinking (Hakulinen, Elovainio, et al., 2015; Hakulinen, Hintsanen, et al., 2015; Terracciano & Costa, 2004; Turiano et al., 2012) as well as physical inactivity (Sutin et al., 2016). One longitudinal study found that adults with an Overcontrolled profile had the poorest health across eight years (Kinnunen et al., 2012).

The Undercontrolled profile, known for impulsivity and lack of control, is typically identified by high openness and extraversion (De Clercq et al., 2012; Herzberg & Roth, 2006; Kinnunen et al., 2012) and low conscientiousness and agreeableness (De Clercq et al., 2012; Herzberg & Roth, 2006; Kinnunen et al., 2012; Yin et al., 2021; Zhang et al., 2015). Lower conscientiousness and higher extraversion are associated with heavy drinking (Hakulinen, Elovainio, et al., 2015), and current

smoking (Hakulinen, Hintsanen, et al., 2015). Kinnunen et al. (2012) found that the Undercontrolled profile was associated with average health.

1.5. The current study

Until now, almost all studies examining personality profiles have been conducted in non-SM samples or studies that did not consider sexual orientation. The current study aimed to examine the differences in the associations between personality profiles and health behaviors in SM and heterosexual middle-aged and older adults. Based on existing findings, I predicted that 1) a Resilient, Undercontrolled, and Overcontrolled profile would be identified by LPA and there would be no significant differences in profile membership by sexual orientation. I also hypothesized that 2) compared to SM participants with another personality profile (i.e., Undercontrolled or Overcontrolled), SM participants with a Resilient profile would be less likely to engage in health-risk behaviors (i.e., smoking, problematic drinking, and substance abuse) and more likely to engage in health-promoting behaviors (i.e., moderate physical activity, routine physical exam).

2. Method

Please see Supplementary Material for more detailed information on the methods, including detailed descriptions of the measures as well as the statistical analyses used in this study. Supplementary Material also includes Tables A-C, containing information on sample characteristics and the results of the LPA.

2.1. Data

This study used combined data from Midlife in the United States II (MIDUS II, 2004–2006, $n = 4963$) and MIDUS Refresher (2011–2014, $n = 3577$). MIDUS II is the second wave of a nationally representative, multidisciplinary study of middle-aged and older adults. MIDUS Refresher recruited new participants to replenish the original MIDUS cohort.

2.2. Sample

The sample for this study combined participants from MIDUS 2 and MIDUS Refresher ($n = 8540$). The final analytical sample ($n = 477$) included 159 SM participants and 318 propensity-score matched heterosexual participants. Of the 159 participants that identified as a SM, 55 identified as gay men, 40 as lesbian women, 29 as bisexual men, and 35 as bisexual women. The 477 participants (M age = 57.3, SD = 10.9 years, range = 40–83 years) were 90.4 % white, 48.9 % female, and well-educated (77.4 % had some college education or more). SM participants and propensity-score matched heterosexual participants did not significantly differ on any of the matching covariates (age, sex, education, race, employment status).

2.3. Measures

2.3.1. Health-risk and health-promoting behaviors

Based on the available measures in MIDUS, three health-risk behaviors (smoking, problematic drinking, and substance abuse) and two health-promoting behaviors (routine physical exam and moderate physical activity) were included in this study. For substance use, participants were asked whether they used ten types of substances on their own in the past 12 months, coded as (1) yes, used any substance in the past 12 months or (0) no, did not use any substances in the past 12 months. Smoking was assessed using a variable that asked participants if they regularly smoke cigarettes now, coded as (1) yes, smoke regularly now and (0) no, do not smoke regularly now. For problematic drinking, a dichotomous variable was constructed to indicate whether the

participant experienced any problematic drinking in the past 12 months, coded as (1), experienced problematic drinking, or (0) no problematic drinking.

Participants were asked how often they engaged in moderate physical activity (e.g., leisurely sports like tennis, low-impact aerobics, and brisk walking) during their leisure or free time (1, Never to 6, Several times a week) with higher scores indicating more frequent moderate physical activity. For routine physical exam, participants were asked how many times they saw a doctor for a routine physical check-up or gynecological exam in the past 12 months, coded as (1) had at least one routine physical health check-up or (0) did not see a doctor in the past 12 months for a routine physical exam.

2.3.2. Personality profiles

LPA was conducted to identify personality profiles using the Big Five personality traits. The five personality traits were assessed via a self-administered measure from the Revised Midlife Development Inventory (MIDI; Lachman & Weaver, 2005) that asked participants how much 26 adjectives described them on a scale from 1 (a lot) to 4 (not at all). The adjectives were selected from previous inventories of the Big Five (e.g., John, 1990); the revised MIDI added an adjective to the conscientiousness scale to improve internal consistency reliability. The MIDI has been previously used and shown to be strongly correlated with the NEO scales (Lachman & Weaver, 2005). The means of the reverse-coded items were calculated for each trait with higher values indicating higher levels of each trait. The five personality traits include Openness ($\alpha = 0.76$; imaginative, creative, sophisticated, broadminded, curious, adventurous, intelligent), Conscientiousness ($\alpha = 0.71$; organized, responsible, hardworking, (not) careless, thorough), Extraversion ($\alpha = 0.71$; outgoing, friendly, lively, talkative, active), Agreeableness ($\alpha = 0.79$; helpful, warm, caring, softhearted, sympathetic), and Neuroticism ($\alpha = 0.73$; moody, worrying, nervous, (not) calm).

3. Results

3.1. Identification of personality profiles

After examining the interpretability of the 5-profile solution which appeared to be the optimal solution, it was determined that a 4-profile solution was conceptually superior and more intuitive to interpret. In

addition, the entropy value was higher for the 4-profile solution than the 5-profile solution (0.78 vs 0.75), indicating that the 4-profile solution was a better fit. The main issue with the 5-profile solution was that two profiles could have been interpreted as the resilient profile.

Fig. 1 shows the mean scores of personality traits for each personality profile. Profile 1 ($n = 168$, 35.2 % of the sample) was identified as the Average personality profile as the means for each personality trait were relatively close to the sample means. Profile 2 ($n = 224$, 47 % of the sample) was identified as the Resilient profile as it had the lowest mean for neuroticism and the highest means for the other four personality traits. Profile 3 ($n = 35$, 7.3 % of the sample) was identified as the Overcontrolled profile as it had the highest mean for neuroticism and the lowest means for the other four personality traits. Profile 4 ($n = 50$, 10.5 % of the sample) was identified as the Undercontrolled profile and was high in neuroticism and agreeableness, low in extraversion and openness, and average in conscientiousness. The personality profiles did not significantly differ in any demographic characteristic, except for sex (see Table 1).

3.2. Personality profiles and health behaviors by sexual orientation

Chi-square and *t*-test analyses were conducted to assess the differences in the health behaviors between SM and heterosexual participants for each of the personality profiles (see Table 2). For the Resilient group, SM participants were significantly more likely to engage in problematic drinking than heterosexual participants (12.5 % vs 1.3 %, $p < .01$). However, Resilient SM participants were significantly more likely to have a routine physical exam than Resilient heterosexual participants (88.9 % vs 82.9 %, $p = .03$). There were no significant differences between SM and heterosexual participants in the Average profile group. For the Overcontrolled group, heterosexual participants were significantly more likely to engage in substance use than the SM participants (29.2 % vs 0 %, $p < .05$). In the Undercontrolled group, SM participants were more likely than heterosexual participants to engage in moderate physical activity ($M = 4.3$, $SD = 1.8$ vs $M = 3.0$, $SD = 1.8$, $p = .03$).

Logistic and linear regression analyses were conducted to assess differences between the Resilient profile and the other personality profiles for the SM and heterosexual groups (See Table 3). Due to small sample sizes, the Average, Overcontrolled, and Undercontrolled groups were combined for comparison with the Resilient group. For the SM

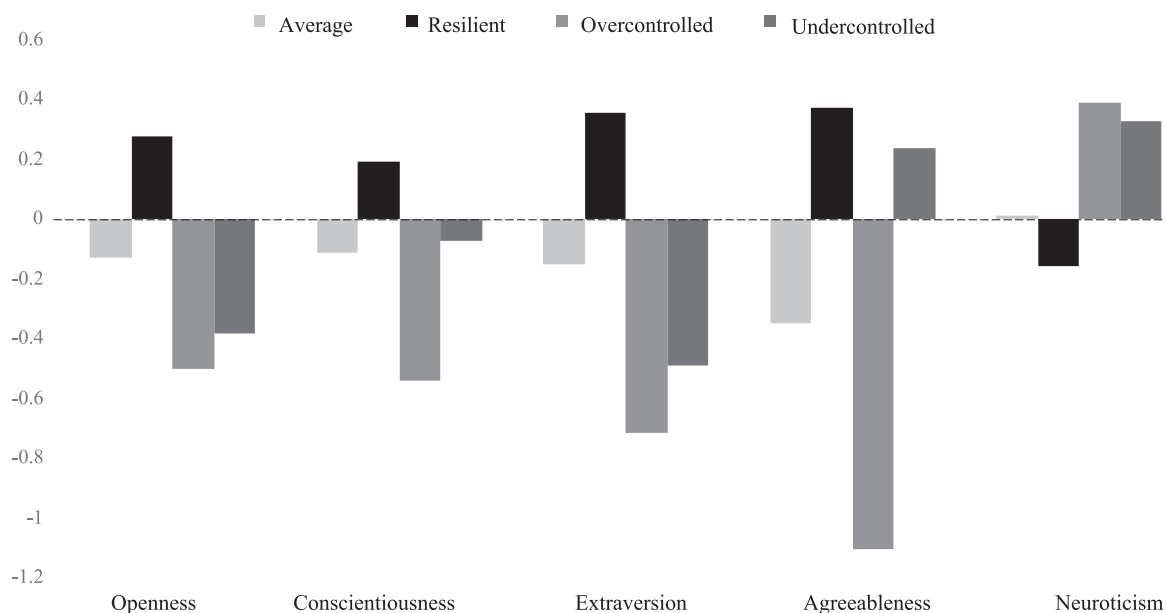


Fig. 1. Centered means of personality factor scores for each of the four identified personality profiles. Note. Mean-centered personality factor scores for each identified personality profile.

Table 1
Characteristics of the personality profiles.

	Overall (n = 477)	Profile 1 <i>Average</i> (n = 168)	Profile 2 <i>Resilient</i> (n = 224)	Profile 3 <i>Overcontrolled</i> (n = 35)	Profile 4 <i>Undercontrolled</i> (n = 50)	p
	%/M (SD)	%/M (SD)	%/M (SD)	%/M (SD)	%/M (SD)	
Age	57.3 (10.9)	57.1 (10.6)	57.5 (11.3)	57.1 (9.9)	57.3 (10.9)	.98
Sex (female)	48.9	39.3	54.0	28.6	72.0	<.01
Sexual orientation						.77
Sexual minority	33.3	36.3	32.1	31.4	30.0	
Heterosexual	66.7	63.7	67.9	68.6	70.0	
Education						.21
High school graduate or less	22.6	20.2	21.0	28.6	34.0	
Some college or more	77.4	79.8	79.0	71.4	66.0	
Race (White)	90.4	90.5	91.1	94.3	84.0	.51
Marital status						.83
Married	52.2	50.6	53.2	48.6	56.0	
Divorced/separated	20.3	24.4	18.6	22.9	12.0	
Widowed	5.8	6.1	5.5	5.7	6.0	
Never married	21.7	18.9	22.7	22.9	26.0	
Employed	64.4	66.5	65.9	48.5	61.2	.44
Openness	3.00 (0.53)	2.86 (0.05)	3.27 (0.12)	2.43 (0.10)	2.61 (0.41)	<.001
Conscientiousness	3.40 (0.48)	3.22 (0.05)	3.53 (0.07)	2.80 (0.11)	3.27 (0.11)	<.001
Extraversion	3.08 (0.57)	2.90 (0.05)	3.41 (0.13)	2.34 (0.08)	2.57 (0.58)	<.001
Agreeableness	3.45 (0.49)	3.09 (0.08)	3.81 (0.03)	2.34 (0.12)	3.68 (0.08)	<.001
Neuroticism	2.09 (0.62)	2.13 (0.05)	1.96 (0.07)	2.51 (0.15)	2.44 (0.50)	<.001
Substance use	18.5	17.9	18.3	20.0	20.0	.98
Current smoker	16.4	16.1	15.6	25.7	14.0	.29
Problematic drinking	6.5	7.1	4.9	14.3	6.0	.37
Routine physical exam	83.4	82.1	84.8	77.1	86.0	.19
Moderate physical activity	4.2 (1.8)	4.2 (1.7)	4.4 (1.7)	3.7 (1.8)	3.6 (1.9)	<.01

Table 2
Differences in health behaviors between sexual minority and heterosexual groups for each personality profile.

Variables	Resilient			Average			Overcontrolled			Undercontrolled		
	Sexual minority (n = 72)	Heterosexual (n = 152)	p	Sexual minority (n = 61)	Heterosexual (n = 107)	p	Sexual minority (n = 11)	Heterosexual (n = 24)	p	Sexual minority (n = 15)	Heterosexual (n = 35)	p
	%/M (SD)	%/M (SD)		%/M (SD)	%/M (SD)		%/M (SD)	%/M (SD)		%/M (SD)	%/M (SD)	
Substance use	23.6	15.8	.31	26.2	13.1	.08	0.0	29.2	<.05	26.7	17.1	.44
Regularly smoke now	15.3	15.8	.26	18.0	15.0	.82	57.1	20.8	.46	36.4	8.6	.16
Problematic drinking	12.5	1.3	<.01	11.5	4.7	.25	27.3	8.3	.31	6.7	5.7	.51
Routine physical exam	88.9	82.9	.03	85.3	80.4	.53	81.8	75.0	.66	86.7	85.7	.73
Moderate physical activity	4.4 (1.7)	4.5 (1.8)	.72	4.3 (1.6)	4.1 (1.7)	.55	3.0 (1.8)	4.1 (1.8)	.11	2.7 (1.8)	4.0 (1.8)	.03

group, there were no significant differences in the health behaviors between the Resilient group and the other personality group. However, linear regression analysis controlling for covariates for moderate physical activity was trending toward significance ($B = 0.59, SE = 0.30, p = .05$). For the heterosexual group, the linear regression analysis assessing the association between personality profile group and moderate physical activity was significant after controlling for covariates ($B = 0.47, SE = 0.20, p < .01$), indicating that heterosexual participants in the Resilient profile engaged in moderate physical activity more than their counterparts in the other personality profiles.

4. Discussion

Extending previous research, this study confirmed the existence of the three most replicable personality profiles (i.e., Resilient, Overcontrolled, and Undercontrolled) as well as a fourth commonly identified personality profile (i.e., Average) in a sample that included SM participants (Kinnunen et al., 2012; Morgan et al., 2017; Zhang et al., 2015). The Resilient profile was found to be the largest group among the

four profiles with slightly less than half of the participants having this protective combination of personality traits with no significant differences in sexual orientation. This significant potential for resilience may help explain why previous studies have found results that are suggestive of resilience in SM older adults (Fredriksen-Goldsen, Kim, Bryan, et al., 2017; Fredriksen-Goldsen, Kim, Shui, & Bryan, 2017; Nelson & Andel, 2020). Fredriksen-Goldsen, Kim, et al. (2014) reported that most SM older adults are aging well and are satisfied with their lives, despite encountering adversity and being at higher risk of poor health.

The SM and heterosexual participants with a Resilient personality profile engaged in more moderate physical activity than their counterparts with other personality profiles, engaging in moderate physical activity several times a month to once a week on average. The results of this study suggest that individuals with a personality combination consisting of high neuroticism, low extraversion, low conscientiousness, and low openness (i.e., Undercontrolled and Overcontrolled profiles) should be targeted in physical activity interventions. This is supported by (non-SM focused) research examining the associations between individual personality traits and physical activity that has found lower

Table 3
Differences between resilient and other personality profiles for sexual minority and heterosexual groups.

	Resilient sexual minority (n = 72)	Other sexual minority (n = 87)	p	Resilient heterosexual (n = 152)	Other heterosexual (n = 166)	p
	%/M (SD)	%/M (SD)		%/M (SD)	%/M (SD)	
Substance use	23.6	23.0	.54	15.8	16.3	.99
Regularly smoke now	15.3	21.8	.44	15.8	14.5	.95
Problematic drinking	12.5	12.6	.88	1.3	5.4	.05
Routine physical exam	88.9	85.1	.75	82.9	80.7	.10
Moderate physical activity	4.4 (1.7)	3.8 (1.8)	.06	4.5 (1.8)	4.1 (1.8)	.06

	Resilient sexual minority (reference = other sexual minority)	Resilient heterosexual (reference = other heterosexual)
	OR (95 % CI)/B (SE)	OR (95 % CI)/B (SE)
Substance use	1.07 (0.46–2.47)	1.01 (0.53–1.93)
Regularly smoke now	0.70 (0.26–1.89)	1.30 (0.61–2.75)
Problematic drinking	1.51 (0.41–3.44)	0.28 (0.05–1.48)
Routine physical exam	1.74 (0.51–5.91)	0.80 (0.42–1.50)
Moderate physical activity	B = 0.59, SE = 0.30, p = .05	B = 0.47, SE = 0.20, p < .01

Note. Logistic and linear regression analyses controlled for age, sex, education, race, marital status, and employment status. The other group is comprised of participants with an Average, Overcontrolled, or Undercontrolled profile.

neuroticism, higher conscientiousness, and higher extraversion were associated with increased physical activity (e.g., Wilson & Dishman, 2015). Regular moderate physical activity consisting of aerobic and muscle-strengthening activities is recommended for all older adults to improve psychological well-being, improve balance, prevent falls, and manage or prevent some chronic conditions (World Health Organization, 2020). There is a large body of research on the health benefits of physical activity in older adults in the general population. Research has found that physical activity can reduce the prevalence of chronic conditions such as cardiovascular disease and diabetes (Lacey et al., 2015) as well as improve mental health in older adults (Callow et al., 2020). Research has also found that physical activity can reduce the risk of cognitive decline (Brini et al., 2018; Sofi et al., 2011) and reduce mortality rates (Shaked et al., 2021).

When examining differences between SM participants and heterosexual participants in each personality profile, it was found that only the Resilient SM participants were significantly more likely to get a routine physical exam than the Resilient heterosexual participants. However, as mentioned in the introduction, SM individuals are at higher risk of poor health compared to their heterosexual counterparts; this increased risk of poor health may explain why resilient SM individuals were more likely to get a routine physical exam. Additionally, changes in policies such as the implementation of the Affordable Care Act and same-sex marriage being declared legal in all 50 states in 2015 have increased access to health insurance for SM adults. However, it is important to note that SM older adults still face barriers to accessing health care including financial difficulties, discrimination, and lack of culturally competent care (Ezhova et al., 2020; Fredriksen-Goldsen et al., 2013). When considered together, the higher rates of routine physical exams in SM participants, even if due to poorer health, while likely facing more barriers than heterosexual individuals may be characteristic of resilience, or the ability to adapt to hardships.

4.1. Limitations and strengths

Limitations of this study include the small sample size and small percentage of participants that engage in the health-risk behaviors, which limited statistical power for the regression analyses to detect significant differences in the health behaviors between each personality profile as well as between SM and heterosexual groups or between SM subgroups. However, the preliminary findings of this study that resilient SM participants differed in both positive and negative ways compared to resilient heterosexual individuals should encourage larger studies to

investigate differences in the manifestations of resilience in SM individuals. Additionally, while MIDUS is a nationally representative sample, the subsample used in this study is not representative of the general population, limiting the generalizability of the findings. Another limitation is the measures for sexual orientation and sex. MIDUS first collected data in 1995; therefore, their sexual orientation (limited to lesbian, gay, bisexual, and heterosexual) and sex (limited to male or female) measures may not be optimal for current best practices. Furthermore, MIDUS did not include a gender identity question, so it was not possible to determine if transgender individuals were included in this study.

Despite the limitations, to the best of my knowledge, this is the first study to use LPA to identify personality profiles in a sample with a focus on SM participants and to examine differences in health behaviors by personality profile between SM and heterosexual middle-aged and older adults. Most previous research using LPA to identify personality profiles did not include data on sexual orientation. MIDUS is one of few population-based studies in the US that collects sexual orientation data (US Department of Health and Human Services, 2011).

4.2. Conclusion

This study contributes new knowledge to our understanding of health and resilience in SM middle-aged and older adults. The results suggest that SM adults have the potential for resilience which is often overlooked in research. Future research should continue to investigate the strengths of SM individuals and not solely focus on deficits.

CRediT authorship contribution statement

Christi Nelson: Conceptualization, Methodology, Software, Formal Analysis, Writing, Visualization.

Availability of data and material

The dataset are available online on the MIDUS website.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.paid.2023.112140>.

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