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Similarities and differences in health-related behavior clustering among older adults in Eastern and Western countries: A latent class analysis of global aging cohorts

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Aim: To quantify variations in health-related behaviors (HRB) clustering of older adults in Western and Eastern countries.

Methods: Using six aging cohorts from the USA, England, Europe, Japan, Korea and China, latent class analysis was applied to access the clustering of smoking, alcohol consumption, physical activity and social activity.

Results: A total of 104 552 participants (55% women) aged ≥50 years in 2010 were included. Despite a different number of clusters identified, three consistent cluster profiles emerged: "Multiple-HRB" (ex-/never smoking, moderate drinking, frequent physical and social activity); "Inactives" (socially and physically inactive without other risk behaviors); and "(ex-)Smokers with Risk Behaviors". Sex and cohort variations were shown. For men in Western cohorts, "Multiple-HRB" was the predominant cluster, whereas their Asian counterparts were more likely to be members of the "Smokers with risk behavior" and "Inactives" clusters. Most women, particularly those in Asian cohorts, were never smokers and non-drinkers, and most of them belonged to the socially "Inactives" cluster.

Conclusions: We provide a person-centered understanding of HRB clustering of older adults over selected countries by sex, informing tailored health promotion for the target population. **Geriatr Gerontol Int 2019; 19: 930–937**.

Keywords: clustering, health-related behaviors, latent class analysis, multiple risk factors.

Introduction

Extending the lifespan of effective functioning and independence is a public health priority worldwide. Modifiable health-related behaviors (HRB) are key contributors to chronic diseases and early mortality, even in older age[1] insofar as by maintaining a healthy lifestyle, the processes of frailty, disability and dementia can be delayed.[2]

Despite cultural and sociodemographic differences, healthy lifestyle recommendations are similar across countries, namely, non-smoking, non-excessive alcohol consumption and regular physical exercise.[2] International epidemiological studies have shown that HRB do not co-occur within individuals by chance, but rather cluster,[3] where a given combination of HRB is more prevalent than expected if they were independent.[4] Smoking, alcohol consumption and physical activity were the most frequently studied HRB. The clustering of smoking with alcohol consumption, and the absence or presence of all HRB have been identified fairly consistently in Europe,[5] the UK[6] and the US,[3] but evidence in Asian countries is scarce.[7,8]

Research on HRB clustering in older-age populations has, however, been limited. Just eight out of the 56 studies on HRB

clustering (till 2014) reviewed by Noble *et al.*[3] focused on adults aged ≥50 years, besides a few recent updates.[5,9] Some of these studies suggest that older adults tend to adopt more positive HRB (e.g. less likely to smoke, moderate alcohol consumption) than their younger counterparts;9–11 whereas other studies have found that older age is associated with more negative HRB, reflecting a heterogeneous lifestyle.[7,8] Age-related functional declines might also result in specific HRB clustering in older age, driven by less frequent physical activity[7,10,11] and social participation.[12] Only one study considered social interaction and church attendance.[13] However, as it was on religious involvement only, the HRB clusters identified might not apply to other non-religious populations.

Furthermore, substantial differences in methodologies across studies make it difficult to draw consensus about HRB clustering.[3] Previous studies used different selection and measurement of HRB, with some studies likely to be limited by selection bias.[3] A number of studies calculated the observed/expected prevalence ratio to study the strength of HRB clustering, whereas others used data reduction techniques.[7–9] The utilization of more advanced techniques, such as latent class analysis (LCA) allows the identification of underlying HRB clustering in a person-centered manner, and provides more analytical options other than dichotomized measures.[4]

The present study aimed to quantify variations in HRB clustering across an expanded representation of Western and Eastern countries, by applying the same statistical method LCA to six population-representative aging cohorts with comparable HRB measures from the USA, England, Europe, Japan, Korea and China.

Methods

Study population

Individual participant data from six aging cohorts were used: the Health and Retirement Study (HRS)[14] the English Longitudinal Study of Ageing (ELSA)[15] the Survey of Health Aging and Retirement in Europe (SHARE)[16] the Japanese Longitudinal Study of Aging (JSTAR);17 the Korean Longitudinal Study of Aging (KLoSA)[18] and the China Health and Retirement Longitudinal Study (CHARLS).[19] Variables were harmonized in the gateway of global aging data to facilitate cross-national comparisons. The present study included participants aged ≥50 years in 2010 with at least one HRB measure. Considering lifestyle variations, SHARE was regrouped as Northern Europe (Demark and Sweden), Western Europe (Netherlands, Germany, Belgium, Switzerland and France), Southern Europe (Italy, Spain and Portugal), and Eastern/Central Europe (the Czech Republic, Austria, Slovenia, Poland and Hungary), based on traditions, behavioral patterns and the Active Aging Index.[20] The above cohorts had obtained ethical approval from the relevant committees; all participants signed informed consent.

HRB measures

In accordance with the literature and available measures in the selected cohorts, four HRB were chosen (for harmonization details see Table S1).[1,4] Smoking was categorized as non-smoker, ex-smoker or current smoker, derived from the participant's smoking history and current smoking behavior. Drinking was grouped as "non-drinker", "0–2 drinks/day" or ">2 drinks/day" based on the frequency and quantity of alcohol consumption. Physical activity was divided as "non-weekly exercise" and "weekly exercise" (moderate or vigorous physical activity at least once per week), to reflect physical activity recommendations for older adults[21] and to maximize the comparability of survey-specific questions. Social activity (i.e. participating in volunteer or charity work, attending an educational or training course, being a member of a sport, social or other club, or attending non-/religious meetings or activities) was quantified as "frequent" if participants reported engaging in these activities no less than once per week, or "infrequent" if participating less frequently or not at all.

Statistical analysis

The age-standardized prevalence of HRB was calculated by the direct method, with the weighted population across cohorts taken as the reference for standardization. We examined cohort differences in HRB clustering in two ways: cluster patterns (i.e. number of clusters and combination of HRB) and cluster membership (i.e. proportion of the cohort belonging to each cluster) using LCA.[22] LCA models use respondents' responses across the target observed variables (i.e. item response probability) to identify latent classes of response patterns in the data. Analysis was carried out in men and women separately, given the substantial sex differences in HRB clustering.[3,8] To select an appropriate number of HRB clusters in each cohort, several fit indices were considered, log-likelihood, adjusted Bayesian information criterion, entropy and the Lo–Mendell–Rubin likelihood ratio test.[22,23] These model indices have been identified as reliable indicators to distinguish a subpopulation mixture distribution from a homogenous non-normal distribution.[23] We placed more emphasis on the adjusted Bayesian information criterion, as it balances model fit with parsimony[22] and has been found to perform well in large samples.[23] We also considered cluster size being no less than 5% and cluster interpretability. Missing data (14%) were handled with the full information maximum likelihood procedure. Sensitivity analyses with only complete cases (n = 90 239) were carried out to compare findings of full information maximum likelihood models. Age-standardized HRB prevalence was estimated using Stata version 14.0 (StataCorp, College Station, TX, USA) and LCA was estimated by Mplus version 7.4 (Los Angeles, CA).[24] We used radar charts to aid visual interpretation, which show the item response probabilities of HRB for a given latent cluster on its axis.

Results

Prevalence of HRB across cohorts by sex

The analysis included 104 552 participants (55% women) aged ≥50 years of the six cohorts. Participants' demographic characteristics of each cohort are presented in Table S2. Table 1 shows the age standardized prevalence of HRB by sex and by cohort. For men, many of the cohorts consisted of ex-smokers or non-smokers and moderate drinkers, who were physically active but socially inactive. Different HRB prevalence was found in CHARLS (i.e. 57% current smokers and 47% social active), and KLoSA (i.e. 55% heavy drinkers and 62% physical inactive). Women from most of the cohorts were never smokers, and the majority of the three Asian cohorts were non-drinkers. Over half of women participated in weekly physical activity, except for those in Korea (32%). Apart from women in Northern Europe (51%) and China (45%), most women were not frequently engaged in social activities.

Cluster patterns

Model fit indices for all LCA models are presented in Tables S3 (men) and S4 (women). Although a three-class solution was the most common choice for the number of clusters, a two-class solution was suggested by model fit indices for men of ELSA, Southern Europe of SHARE, KLoSA and CHARLS, and for women of Western Europe of SHARE and JSTAR (Table 2). A two-cluster solution was also suggested for women in CHARLS, but the proportion of women belonging to the second cluster was small (6%), and differed from the other cluster only in its higher probability of moderate alcohol consumption. It was thus decided to maintain the one-cluster solution for women in the CHARLS cohort.

Despite differences in the number of latent clusters obtained, three largely consistent HRB clusters emerged across the cohorts.

Table 1 Age-standardized health-related behavior characteristics of the analytical sample by sex and cohort

	Men									Women								
Cohort	ELSA	HRS	SHARE				JSTAR	KLoSA	CHARLS	ELSA	HRS	SHARE				JSTAR	KLoSA	CHARLS
Country	England	US	N-EU	W-EU	S-EU	E-EU	Japan	Korea	China	England	US	N-EU	W-EU	S-EU	E- EU	Japan	Korea	China
No.	4010	8777	1921	8374	4102	7644	2032	3410	6714	4973	11 560	2240	10 237	4988	10 103	2114	4510	6843
Smoking status (%)																		
Never smoker	31.4	35.9	40.1	36.4	36.7	32.7	27.8	61.0	26.7	42.8	49.4	43.0	60.8	70.0	57.7	81.4	97.2	90.7
Ex-smoker	53.2	46.9	39.3	40.8	37.2	34.0	44.7	0.9	16.8	41.7	35.9	37.7	21.1	15.0	18.0	10.2	0.1	2.3
Current smoker	15.4	17.2	20.6	22.8	26.1	33.3	27.5	38.1	56.5	15.5	14.7	19.3	18.1	15.0	24.3	8.4	2.7	7.0
Drinking (%)																		
Non-drinker	5.5	17.3	1.5	2.3	9.2	5.6	33.3	29.0	24.0	9.4	26.7	3.6	7.6	34.5	20.1	72.6	77.9	75.7
0-2/day	57.4	65.0	63.3	71.1	71.8	65.3	49.7	15.8	67.5	74.8	68.2	79.9	82.0	60.6	70.7	21.8	9.6	23.8
>2/day	37.1	17.7	35.2	26.6	19.0	29.1	17.0	55.2	8.5	15.8	5.1	16.5	10.4	4.9	9.2	5.7	12.5	0.6
Weekly physical activity (%)																		
Active	78.6	75.0	92.5	88.6	79.7	77.0	69.3	37.5	61.0	74.5	68.5	91.6	87.2	73.3	74.7	83.0	32.1	54.3
Inactive	21.4	25.0	7.5	11.4	20.3	23.0	30.7	62.5	39.0	25.5	31.5	8.4	12.8	26.7	25.3	17.0	67.9	45.7
Frequent social activity (%)																		
Yes	38.0	27.7	42.9	36.0	22.0	26.4	20.3	24.1	45.6	36.7	29.6	51.2	38.5	24.3	29.6	16.2	32.8	45.0
No	62.0	72.3	57.1	64.0	78.0	73.6	79.7	75.9	54.4	63.3	70.4	48.8	61.5	75.7	70.4	83.8	67.2	55.0

Data from participants aged ≥50 years in the 2010 Health and Retirement Study (HRS), English Longitudinal Study of Aging (ELSA), the Survey of Health Aging and Retirement in Europe (SHARE), Japanese longitudinal study of Aging (JSTAR), Korean Longitudinal Study of Aging (KLoSA), and China Health and Retirement Longitudinal Study (CHARLS). E-EU, Eastern European Union represented by Czech Republic, Austria, Slovenia, Poland and Hungary; N-EU, Northern European Union represented by Demark and Sweden; S-EU, Southern European Union represented by Italy, Spain and Portugal; W-EU, Western European Union represented by Netherlands, Germany, Belgium, Switzerland and France.

Table 2 Goodness of fit indices for chosen cluster solution by sex and cohort

Cohort	No. clusters	Log likelihood	aBIC	Entropy	LMR-LRT *P*-value	Smallest size, *n* (%)
Men						
ELSA (UK)	2	−10 956.50	21 979.55	0.72	<0.001	925 (23%)
HRS (USA)	3	−26 381.36	52 944.32	0.89	<0.0001	1414 (16%)
SHARE						
Northern EU	3	−5122.29	10 332.25	0.82	<0.0001	93 (5%)
Western EU	3	−23 131.56	46 380.23	0.74	<0.0001	936 (11%)
Southern EU	2	−11 466.84	23 000.53	0.99	<0.0001	935 (23%)
Eastern EU	3	−22 092.06	44 299.40	0.76	<0.0001	1267 (17%)
JSTAR (Japan)	3	−5475.88	11 040.55	0.84	0.02	322 (16%)
KLoSA (Korea)	2	−9472.86	19 010.16	0.70	<0.0001	1366 (40%)
CHARLS (China)	2	−17 674.40	35 422.05	0.73	<0.0001	2676 (40%)
Women						
ELSA (UK)	3	−13 462.08	27 030.84	0.77	<0.001	1230 (25%)
HRS (US)	3	−33 847.29	67 881.68	0.70	<0.0001	3118 (27%)
SHARE						
Northern EU	3	−5820.25	11 731.24	0.70	<0.0001	156 (7%)
Western EU	2	−27 002.45	54 083.63	0.86	<0.0001	1732 (17%)
Southern EU	2	−12 882.32	25 834.01	0.79	<0.0001	2150 (43%)
Eastern EU	3	−27 288.15	54 697.15	0.80	<0.0001	2456 (24%)
JSTAR (Japan)	2	−4022.47	8103.17	0.94	0.005	352 (17%)
KLoSA (Korea)	3	−9179.08	18 462.89	0.73	0.05	316 (7%)
CHARLS (China)	1	−12 625.05	25 303.08	—	—	6843 (100%)

Data from participants aged ≥50 years in 2010 Health and Retirement Study (HRS), English Longitudinal Study of Aging (ELSA), the Survey of Health Aging and Retirement in Europe (SHARE), Japanese longitudinal study of Aging (JSTAR), Korean Longitudinal Study of Aging (KLoSA), and China Health and Retirement Longitudinal Study (CHARLS). Selected cluster solution was a model with a lower adjusted Bayesian information criterion (aBIC), a higher entropy (closer to 1), *P*-value of Lo–Mendell–Rubin likelihood ratio test (LMR-LRT) <0.05 (i.e. models with additional cluster improved the model fit) and cluster size no less than 5% of the study sample.

Based on the response probabilities of the four HRB within each HRB clustering (Figs 1–2), we cautiously labeled these three clusters to aid interpretability, while acknowledging heterogeneity in HRB clustering across the cohorts.

Cluster 1, labeled "Multiple-HRB", was characterized by more positive HRB than the other two clusters. Individuals in this cluster were likely to be ex-smokers (for men) or never smokers (for women), moderate drinkers (or non-drinkers for Asian women), and engage in frequent physical and social activities.

Cluster 2, labeled "Inactives", was notably distinguished from the other clusters by infrequent social and physical activities combined with the absence of other risk behaviors. Most individuals with this behavior pattern were ex- or non-smokers, and were moderate or non-drinkers, particularly for women.

Cluster 3, labeled "(ex)Smokers with Risk Behaviors", was characterized by a higher probability of being current smokers (for men) or ex-smokers (for women). Other risk behaviors that accompanied smoking varied across the cohorts. Smoking co-occurred with high alcohol consumption amongst men of HRS, SHARE and KloSA, and amongst women of KLoSA. The risk factor of infrequent social activity was broadly present in this cluster across cohorts, except for men from CHARLS. Additionally, for KLoSA participants, a profile of non-weekly exercise was present.

Cluster membership

As shown in Figure 3, for both men and women, the proportion of participants belonging to the HRB cluster differed across cohorts. For men, over half of the ELSA, HRS and SHARE participants were classified as belonging to the "Multiple-HRB" cluster (77%, 63% and 72% respectively), whereas JSTAR and CHARLS were dominated by "Smokers with Risk Behaviors" (53% and 60%, respectively), and 60% of KLoSA were in the "Inactives" clusters.

For women, only Western Europe and CHARLS had most participants belonging to the "Multiple-HRB" cluster (83% and 100%, respectively). All three patterns were well represented in HRS and in the Eastern Europe of SHARE. Approximately half of ELSA, Northern and Southern European participants were "(ex) Smokers with Risk Behaviors", with the secondary cluster of "Multiple-HRB" for Northern Europe (43%) and ELSA (33%). KLoSA was dominated by both "Multiple-HRB" (51%) and "Inactives" (41%) clusters. JSTAR was predominately comprised of "Inactives" (83%). These findings, using full information maximum likelihood to accommodate missing data, were confirmed by our sensitivity analyses.

Discussion

We applied LCA to capture similarities and differences in HRB clustering across six aging cohorts of community-dwelling older adults. Our results showed three largely consistent HRB clusters: the "Multiple-HRB" cluster, characterized by multiple positive HRB; the "Inactives" cluster, distinguished by infrequent social and physical activities, but no other risk behaviors; and the "(ex) Smokers with Risk Behaviors" cluster, with current smoking in men and with ex-smoking in women, coupled by excessive drinking, and being socially or physically inactive. Sex- and cohort-specific variations in these cluster patterns and differences in the proportion belonging to each cluster were also shown.

The present study contributes to the literature by directly demonstrating the general similarities alongside variations in HRB clustering across Western and Eastern aging cohorts. The three common cluster patterns found here largely match the HRB structural compositions identified in recent reviews, particularly regarding the clustering of multiple positive HRB,[3,5] and the clustering of smoking and heavy alcohol consumption.[3,6] The present findings showed sex- and cohort-specific patterns of smoking and alcohol consumption. For men, ex-smokers and moderate drinkers were included in the "Multiple-HRB" cluster, whereas current smoking and excessive drinking were the main risk behaviors for the "(ex)Smokers with risk behavior" cluster. For women, most of them were never smokers in the "Multiple-HRB" cluster, and were ex-smokers in the "(ex)Smokers with Risky Behaviors" cluster, with women of the Asian cohorts being most likely to

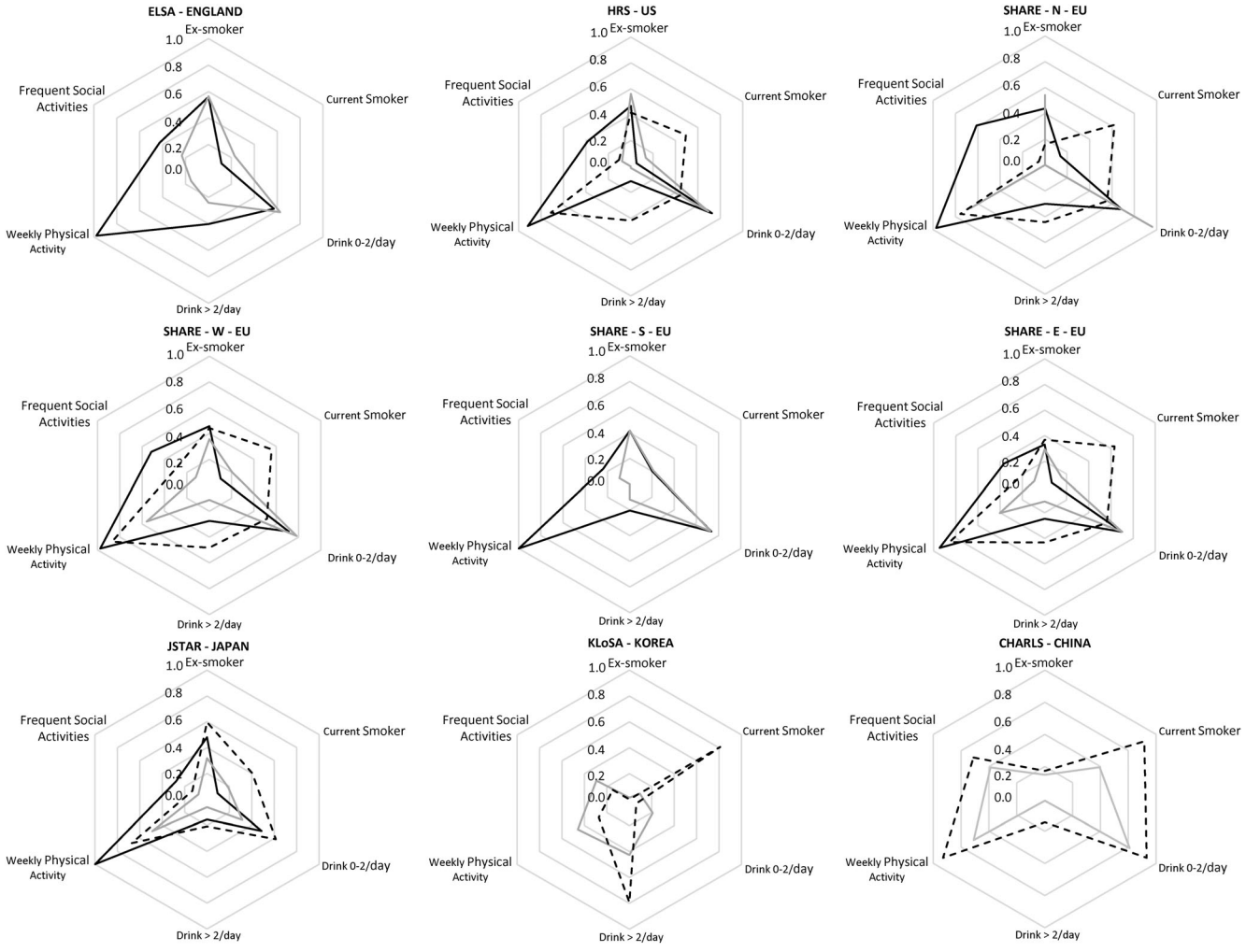

Figure 1 Radar charts of item response probabilities of health-related behavior clustering for three latent clusters by cohort in men. "Multiple-HRB": ex-smoking, moderate drinking, frequent physical and social activity (black line); "Inactives": socially and physically inactive without other risk behaviors (grey line); and "(ex)Smokers with Risk Behaviors" (black dashed line). Data from participants aged ≥50 years in the 2010 Health and Retirement Study (HRS), English Longitudinal Study of Ageing (ELSA), the Survey of Health Aging and Retirement in Europe (SHARE), Japanese longitudinal study of Aging (JSTAR), Korean Longitudinal Study of Aging (KLoSA), and China Health and Retirement Longitudinal Study (CHARLS).

abstain from alcohol. The variation in gendered cluster patterns identified here are consistent with the literature. For example, research has found a much lower prevalence of current smoking and alcohol consumption in older Asian women than men, resulting from traditional social norms and cultural constraints.[7,8,11,17] In contrast, there is a convergence in alcohol consumption between Western women and men, mainly due to increased consumption amongst women.[25]

By incorporating the social engagement component, a key determinant of active aging, the present study provides a more comprehensive description of HRB clustering in older age.[26] We found that the age-standardized prevalence of frequent social activity was low in most cohorts, except for Northern Europe of SHARE and for CHARLS. Despite the limitations of the social activity items for individual surveys, the present findings highlight the prevalently low levels of social engagements among older adults. However, the frequency of social engagement has rarely been explored in previous studies, and less is known about its association with other HRB. The present results show that the "Inactives" cluster was characterized by socially inactive participants, whose estimated probability of weekly physical activity was lower than the other two clusters; yet they neither smoked nor drunk alcohol excessively. Comparable clusters characterized by insufficient physical activity with no other risk behaviors have been found in German[5,10] and Taiwanese[11] middle- to older-aged samples, with no indicators of participants' social activity levels. Current health promotion programs mainly focus on smoking, drinking and physical activity, which appears less relevant to this group.[2] The present findings show the need for greater emphasis on building pathways to facilitate social engagement in older adulthood.

The varied prevalence of cluster membership across the cohorts is also noteworthy. For men in each Western cohort, "Multiple-HRB" was the predominant cluster, whereas their Asian counterparts were more likely to be members of the "(ex)Smokers with Risk Behavior" and "Inactives" clusters. Sociocultural tolerance of smoking might help to explain the low smoking cessation rate amongst men from the Japanese and Chinese cohorts. In China, smoking is regarded as a necessary for socializing among men, especially amongst older generations with poor health literacy.[27] This is in keeping with our findings that smoking was associated with frequent social activity in CHARLS. In both countries, smoking is permitted in public places and cigarette taxation is low, partially due to strong opposition from the tobacco and catering service industries.[27,28]

Corresponding to our findings on the largest "Inactives" cluster in KLoSA, a low rate of adherence to healthy lifestyles, particularly with infrequent physical activity among older Korean men, has been reported by Lee *et al.*[8] The authors suggested that the lack of evidence-based programs and co-ordination between

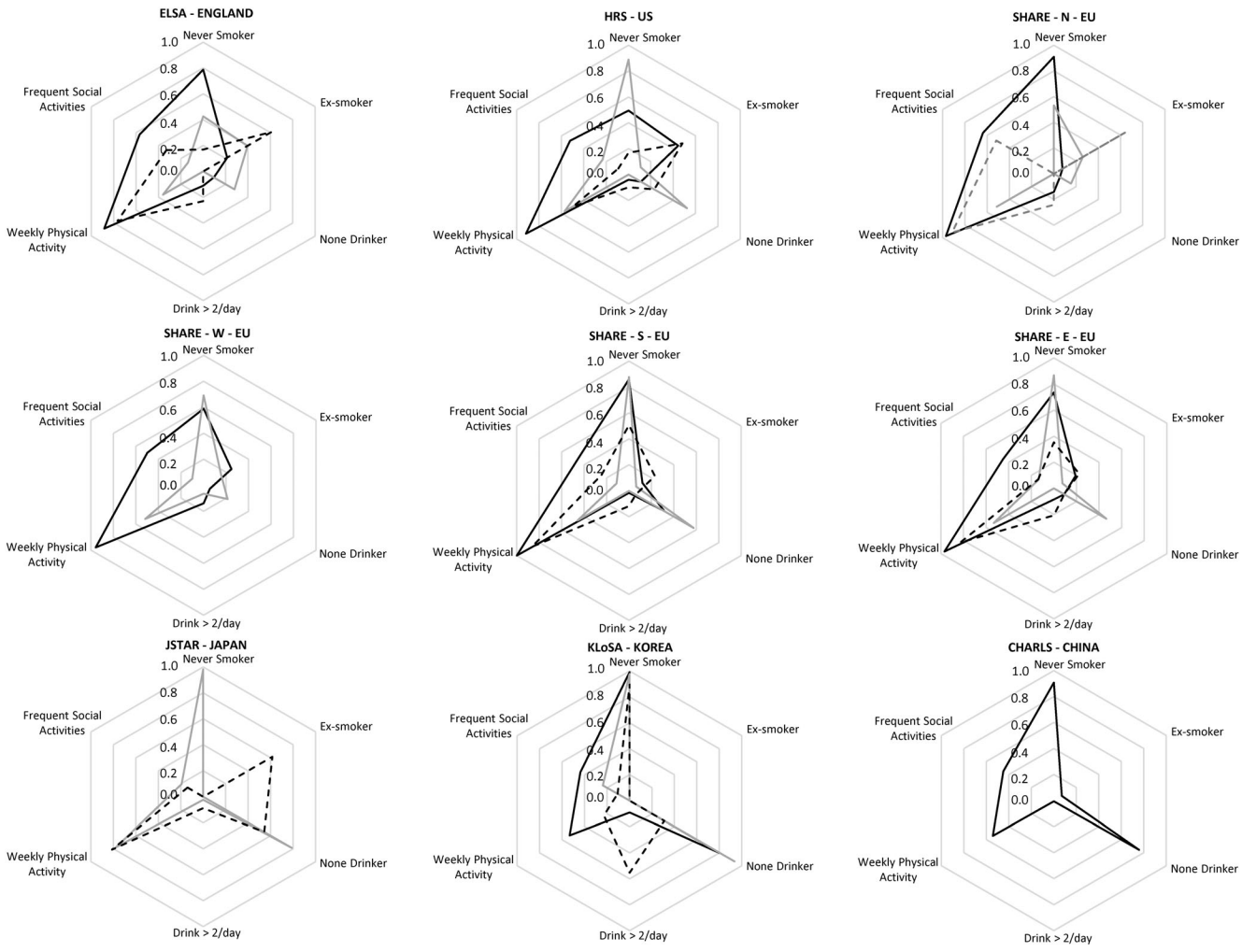

Figure 2 Radar charts of item response probabilities of health-related behavior clustering for three latent clusters by cohort in women. "Multiple-HRB": never-smoking, non/moderate drinking, frequent physical and social activity (black line); "Inactives": socially and physically inactive without other risk behaviors (grey line); and "(ex)Smokers with Risk Behaviors" (black dashed line). Data from participants aged ≥50 years in the 2010 Health and Retirement Study (HRS), English Longitudinal Study of Ageing (ELSA), the Survey of Health Aging and Retirement in Europe (SHARE), Japanese longitudinal study of Aging (JSTAR), Korean Longitudinal Study of Aging (KLoSA), and China Health and Retirement Longitudinal Study (CHARLS).

governmental agencies for physical activity promotion should take the blame. The "Inactives" cluster was also predominantly women of KLoSA, Southern Europe and JSTAR. The strikingly high proportion of socially inactive women in the Japanese cohort, who otherwise had no other risk behaviors, might be explained by the persistent gender roles in Japan. Women are expected to undertake the majority of domestic duties, leading to constraints and a reluctance to spend time engaging with social networks beyond their immediate family.[29]

The strength of the present study lies in its utilization of six comparable population-representative aging cohorts, which provides a unique opportunity to carry out a multinational study of HRB clustering on a scale that has not been achieved before. Our study lends important insights into the similarities and differences in the clustering of HRB evident amongst middle- and older-aged adults across sociocultural heterogeneous populations.

Nevertheless, the interpretation of these findings requires caution. First, the present study relies on self-reported HRB measures. Participants might respond to these questions in line with social desirability. We suspected that uniformed bias in underestimation of health damaging behaviors and the overreporting of health promoting behaviors might exist across the cohorts. Second, it is acknowledged that the HRB measures were not identical across the cohorts, despite considerable efforts made in variable harmonization. Confined to the measures available, the present study was unable to make more fine-grained categories for some harmonized measures; or include more lifestyle factors, such as nutrition, which was absent in most of the cohorts. Replication of our study using other datasets with more detailed HRB measures would be advantageous.

Third, the current study only examined HRB clustering by sex and cohort, which might also be influenced by socioeconomic status. Despite that the application of survey weights might have accounted for some of the differences, it will be important for future research to further investigate socioeconomic variations from cultural mechanisms. Fourth, the current study only used HRB measures assessed at one time point. This overlooks cumulative exposure to these factors and so cannot show changes in HRB with age. Although within-person change in HRB might not be substantial in older adulthood, examining behavioral patterns over multiple waves would advance our knowledge of how divergent longitudinal patterns of HRB unfold in older age. Finally, the current study compared HRB clustering across cohorts, and yet explored the extent to which these complex webs of HRB patterns would be associated with distal health outcomes. Our subsequent studies will investigate how participants with different HRB profiles would age physically and mentally against the global aging context.

In conclusion, we provide a fine-grained analysis on HRB clustering across six aging cohorts in Eastern and Western countries. The present findings suggest a large degree of consistency in HRB clustering across Western and Eastern cohorts, but with sex and cohort variations in cluster patterns and membership. A person-centered understanding of the combination and distribution of

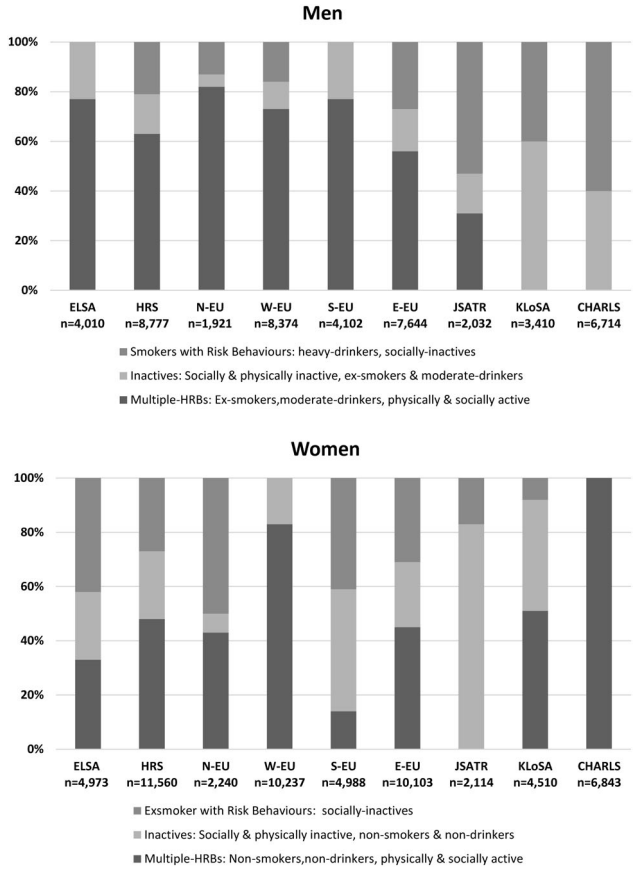

Figure 3 The proportions of health-related behavior cluster membership by sex and cohort. Data from participants aged ≥50 years in the 2010 Health and Retirement Study (HRS), English Longitudinal Study of Aging (ELSA), the Survey of Health Aging and Retirement in Europe (SHARE), Japanese longitudinal study of Aging (JSTAR), Korean Longitudinal Study of Aging (KLoSA), and China Health and Retirement Longitudinal Study (CHARLS).

multiple HRB might facilitate identifying subpopulations most at risk, and informing the design of sex- and context-specific health promotion programs.

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Disclosure statement

The authors declare no conflict interest.

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Supporting information

Additional supporting information may be found in the online version of this article at the publisher's website:

Table S1 Cohort-specific health-related behavior questionnaire item and harmonizing strategy.

Table S2 Sociodemographic characteristics of study cohorts.

Table S3 Goodness of fit indices for latent profile analysis models, by cohort for men.

Table S4 Goodness of fit indices for latent profile analysis models, by cohort for women.

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