Article

Accessibility, Functioning, and Activities of Daily Living with Visual Impairment amongst Adults from Minority Ethnic Communities in the UK

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Abstract: Visual impairment (V.I.) has been associated with a negative impact on activities of daily living (ADL) and navigation outside the home. Adults from minority ethnic communities are projected to make up an increasing proportion of the V.I. population in the UK, yet the evidence relating to their experiences of living with V.I. is limited. This article uses data collected by the V.I. Lives Survey, between December 2019 and November 2020. Using secondary analysis of anonymised survey data, this article explores self-reported functioning relating to ADL, navigation outside of the home, and use of technology to access information in a matched control sample of adults from minority ethnic (MEC) and white communities (WC). The findings showed that most issues relating to self-efficacy, accessibility of public environments, and technology were significantly more important to MEC than WC participants. A significantly higher proportion of MEC participants required frequent help with cooking, received support for ADL from siblings and other family members, and had their shopping delivered. WC participants were significantly more likely to receive help with shopping from their spouse/partner and use public transport as much as they liked. Future research will need to confirm these findings in a larger sample and explore the reasons for them.

Keywords: accessibility; functioning; minority ethnic communities; visual impairment; activities of daily living; navigation; assistive technology

1. Introduction

The number of people with visual impairment (V.I.) is predicted to increase in the United Kingdom (UK) [1]. Considering that people from minority ethnic communities (MEC) are at increased risk of V.I. [2,3], it is important to understand their lives and experiences to ensure support is available where needed. A recent publication on MEC found Asian communities to report poorer mental health and well-being experiences, as well as experiences of discrimination [4].

The adverse effects of V.I. on activities of daily living (ADL) have been previously documented [5,6], including impacts on getting dressed [7], preparing a meal [8], shopping [9], and leaving the house [10]. Participation in ADL has been linked with improved quality of life among people with V.I. [9]. V.I. has further been associated with a negative impact on independent navigation [11,12]. Assistive technologies (ATs) can play a vital role in assisting navigation and thus improve the quality of life of people with V.I. [13]. ATs are not only used for navigation, they also have a plethora of applications in the lives of people with V.I., such as object recognition, information access, and social interactions [14]. Thus, they have the ability to increase independence and safety, and improve the quality of life of people with V.I. [15].

Socioeconomic factors, such as low income, have been linked to lower awareness of existing aids [16]. People from MEC are more likely to live in low-income households [17,18],

and this may impact the uptake and use of ATs among MEC. However, a recent rapid evidence review found considerable gaps in the evidence relating to the acceptability and use of aids as well as ADL and navigation among MEC adults with V.I. in the UK [19].

The purpose of this article is to explore the experiences of MEC in the UK, focusing on aspects of V.I. specific to accessibility, function, and activities of daily living, aiming to increase knowledge relating to ADL, navigation, mobility outside the home, aids, and assistive technologies.

2. Materials and Methods

This article forms part of a series that explores the life experiences of UK MEC adults [20–23]. This series reports findings from a secondary analysis of survey data collected as part of the V.I. Lives Survey. V.I. Lives was commissioned by three UK sight loss charities: Royal National Institute of Blind People (RNIB), Thomas Pocklington Trust (TPT), and Guide Dogs for the Blind Association (Guide Dogs). The following paragraphs provide a brief summary of the V.I. Lives survey for context; however, a report published by the charities (the data controllers) provides details about the methods employed in the V.I. Lives survey and results for the full sample [24].

Participants were recruited through social media, radio adverts, national and local charities, and Acumen's healthcare database. Potential participants were screened in an initial phone call and excluded if they did not speak English and/or did not have V.I.

V.I. status was determined based on the self-reported V.I. registration status (registered as severely sight impaired, partially sight impaired, unsure of the category in which they were registered, or not registered), difficulties with near, distance, and/or peripheral vision (ability to see a person from a certain distance, to read newsprint, and to see people or things in the periphery of their vision), and legal ability to drive [23]. Quantitative survey data were collected over the phone by two market research agencies (Insight Angels and Acumen Fieldwork). Fieldwork took place in two batches: from December 2019 to March 2020 and from August to November 2020. A total of 769 people with V.I., aged between 13 and 78, took part in the survey. An anonymised dataset was shared with the authors, and permission was granted to conduct the secondary analysis reported in this series of articles by the data controllers.

2.1. Materials

The V.I. Lives Survey was a cross-sectional study and covered the following topics: health, well-being, relationships, attitude to life, getting out of the home, leisure, work, education, benefits and finances, technology and media, accessible information and reading, domestic support, charity awareness and usage, making everything better, and coronavirus.

Ethnicity. A question asked participants to indicate which of the following they would use to describe their ethnic background: White British, White other, Mixed/Multiple ethnic groups, Asian/Asian British, Black/African/Caribbean/Black British, Other ethnic group, and Prefer not say.

Activities of daily living. Participants were asked how frequently and from whom they had received help with the following tasks: preparing food, personal care, getting around the home, taking medication, and getting dressed, to assess functioning and status relating to activities of daily living. Participants were also asked if they were able to go out and do their shopping as much as they would like to and who provided help with shopping. A set of questions explored the importance of a list of issues, among which were: "Confidence in my ability to do everyday tasks" and "Help and support to take care of myself and my home", to address the importance of having the ability or required support to carry out activities of daily living.

To assess the accessibility of information, participants were asked to rate the importance of issues relating to "Format of information provided by service providers", and to indicate if they had requested information they received from banks, health providers, and utility companies in an accessible format, and if they were aware that they could request to

receive this information in an accessible format. They were further asked how often anyone helped them by reading printed materials that are not in their preferred format and how easy or difficult it was to read the instructions on medication packaging.

Navigation. A set of questions also explored the importance of "The accessibility of public transport (signage, announcement, and training of drivers/staff)", "The design and accessibility of public buildings", "Reduction of obstacles and street clutter", and "Better route planning and navigation aids", which addressed the importance of aspects of the outside environment that might affect people's ability to navigate outside the home. To assess status relating to navigation, people were asked to indicate if they used public transport, were able to get out and about as much as they would like to, felt able to get out and about independently in their local area, had been injured or hurt by any obstacles on the pavement while out and about in the last year, and how often they generally left home and went outside.

Information and technology. Participants were asked to rate the importance of issues relating to "Access and support to use the Internet", "Training to use technology to its full potential", "Accessibility features of mainstream technology", and "New smart technology and apps to support people with V.I.". In addition, participants were asked to indicate what type of software or adjustments they used to help access computers/laptops/tablets or smart phones.

2.2. Data Analysis

To control for the unequal subgroup sizes and differences between MEC and WC participants, a matched control sample consisting of 77 MEC and 77 WC participants was drawn in R [25]. Matching variables included the UK region and whether the participants lived in rural areas vs. towns. Although the survey was not specifically designed to compare different groups, the subgroup analysis compared MEC to WC participants. Response distributions for variables were calculated as counts (*n*) and proportions (%) by subgroup using SPSS [26]. Subgroup analysis used Mann–Whitney *U* tests for ordinal and chi-square tests for categorical variables. Where assumptions of expected cell counts were violated, Fisher's exact tests were conducted in R.

3. Results

Table 1 provides a summary of characteristics for the MEC and WC groups. There were no significant differences in age ($M = 40.87$ vs. $M = 41.09$, $t(154) = 0.124$, $p = 0.902$), gender ($X^2 (4, 154) = 0.00$, $p = 1.000$), UK region (Fisher's exact $p = 0.344$), setting ($X^2 (2, 154) = 4.68$, $p = 0.097$), employment status ($X^2 (4, 154) = 0.33$, $p = 0.988$), level of education ($U = 2794$, $p = 0.397$), marital status (Fisher's exact $p = 0.835$), or V.I. severity ($U = 2951$, $p = 0.922$). Both groups consisted of more females (51.9%) than males (48.1%), were predominantly London-based, living in a city or big town, educated at the undergraduate level, employed, and single or married.

Table 1. Participant characteristics by subgroup.

Participant Characteristics	MEC (*n* = 77) % (*n*)	WC (*n* = 77) % (*n*)
Age	$U = 2919.5$, $p = 0.871$	
M (SD)	40.78 (±15.58)	41.09 (±15.62)
Range	18–85	18–85
Gender	$X^2 (1, N = 154) = 0.00$, $p = 1.00$	
Female	51.9 (40)	51.9 (40)
Male	48.1 (37)	48.1 (37)

Table 1. *Cont.*

Participant Characteristics	MEC (*n* = 77) % (*n*)	WC (*n* = 77) % (*n*)
Region	$p = 0.344$	
London	44.2 (34)	31.2 (24)
Southeast	6.5 (5)	2.6 (2)
Southwest	5.2 (4)	3.9 (3)
East of England	5.2 (4)	2.6 (2)
East Midlands	3.9 (3)	5.2 (4)
West Midlands	5.2 (4)	2.6 (2)
Northeast	-	5.2 (4)
Northwest	13.0 (10)	23.4 (18)
Yorkshire and the Humber	3.9 (3)	3.9 (3)
Scotland	7.8 (6)	9.1 (7)
Wales	3.9 (3)	7.8 (6)
Northern Ireland	1.3 (1)	2.6 (2)
England	87.2 (68)	80.5 (62)
Setting	$X^2 (2, N = 154) = 4.68, p = 0.097$	
City/big town	67.5 (52)	55.8 (43)
Small town	22.1 (17)	37.7 (29)
Rural area	10.4 (8)	6.5 (5)
Marital status	$p = 0.835$	
Single	41.6 (32)	37.7 (29)
In a relationship	7.8 (6)	9.1 (7)
Cohabiting	6.5 (5)	10.4 (8)
Married	31.2 (24)	36.4 (28)
Civil partnership	2.6 (2)	-
Separated	1.3 (1)	1.3 (1)
Divorced	6.5 (5)	3.9 (3)
Widowed	2.6 (2)	1.3 (1)
Education [1]	$U = 2794, p = 0.397$	
No formal qualifications	-	5.2 (4)
GCSE/O-Level	11.7 (9)	14.3 (11)
A-Level/Advanced Highers	15.6 (12)	18.2 (14)
Apprenticeship, vocational, NVQ, or HND	16.9 (13)	11.7 (9)
Undergraduate degree	27.3 (21)	31.2 (24)
Masters, PhD	18.2 (14)	16.9 (13)
Non-UK qualifications	3.9 (3)	-
Other	6.5 (5)	2.6 (2)
Employment [2]	$X^2 (4, N = 154) = 0.33, p = 0.988$	
Employed (including part-time)	42.9 (33)	40.3 (31)
Self-employed	6.5 (5)	5.2 (4)

Table 1. *Cont.*

Participant Characteristics	MEC (*n* = 77) % (*n*)	WC (*n* = 77) % (*n*)
Unemployed	14.3 (11)	14.3 (11)
Retired	10.4 (8)	11.7 (9)
Other [2]	26.0 (20)	28.6 (22)
V.I. severity [3]	*U* = 2951, *p* = 0.922	
Severe	39.0 (30)	44.2 (34)
Moderate	35.1 (27)	23.4 (18)
Mild	26.0 (20)	31.2 (24)
Could not be classified	-	1.3 (1)

[1] Statistical analysis excludes 'non-UK qualifications' and 'other'. [2] Due to expected frequencies of less than 5 in 5 cells (27.8%), the categories: looking after family/home, student, long-term sick/disabled, and unpaid work (e.g., volunteering, intern, and work experiences), were collapsed into the 'other' category for the statistical analysis. [3] Statistical analysis excludes 'could not be classified'. MEC = Minority ethnic communities (excluding white minorities), and WC = White communities (including white minorities). Results for Fisher's exact tests are shown as *p*-values only.

3.1. Activities of Daily Living (ADL)

Although more than eight in ten participants in both groups considered ADL-related issues as at least somewhat important, there were statistically significant differences between the two groups. Around half the MEC participants rated *Confidence in my ability to do everyday tasks* (50.6%) as *extremely important* compared to over a quarter of WC participants (28.6%; *U* = 2216, *p* = 0.003). However, the same proportion rated this *as not important at all* (2.6%). Similarly, just under half of MEC participants (46.8%) rated *Help and support to take care of myself and my home as extremely important* compared to 19.5% of WC participants (*U* = 1852, *p* < 0.001). WC participants were more than twice as likely to rate this as *not important at all* (15.6% vs. 6.5%; Table 2).

Table 2. Importance of issues relating to ADL, by subgroup.

Importance of Issues Relating to ADL	MEC (*n* = 77) % (*n*)	WC (*n* = 77) % (*n*)
Confidence in my ability to do everyday tasks	*U* = **2216**, *p* = **0.003**	
Extremely important	50.6 (39)	28.6 (22)
Very important	39.0 (30)	49.4 (38)
Somewhat important	7.8 (6)	19.5 (15)
Not important at all	2.6 (2)	2.6 (2)
Help and support to take care of myself and my home	*U* = **1852**, *p* < **0.001**	
Extremely important	46.8 (36)	19.5 (15)
Very important	29.9 (23)	33.8 (26)
Somewhat important	14.3 (11)	31.2 (24)
Not important at all	6.5 (5)	15.6 (12)
Missing	2.6 (2)	-

MEC = Minority ethnic communities (excluding white minorities), and WC = White communities (including white minorities). Statistically significant results are shown in bold.

When looking at functioning, there were no significant differences in support required for ADL, except where preparing food was concerned (Table 3): 64.9% of WC participants *never* or *rarely* required help with food preparation, compared to 44.8% of MEC participants, 25.0% of whom required help with this *always* or *frequently* compared to 20.8% of WC

participants (U = 2330, p = 0.023). Indeed, most participants from the WC group *never* required support with preparing food (50.6%). Additionally, 70.1% of WC *never* or *rarely* required help taking medications, compared to 55.3% of MEC participants, among whom 22.4% *always* or *frequently* required help with this, compared to 13.0% of WC participants, but this difference did not reach statistical significance (U = 2490, p = 0.083). A large majority of MEC and WC participants indicated that they *never* required support with personal care (74.0% and 75.3%), getting around the home (68.8% vs. 81.8%), getting dressed (71.4%, respectively), and looking after children (62.5% vs. 72.9%). For both groups, the activities that required the most support (*always*) were DIY (do it yourself) projects around the house (36.9% vs. 26.5%) and house cleaning (21.6% vs. 10.7%).

Table 3. Activities of daily living (ADL): importance of issues and support needs relating to ADL by subgroup.

Support Needs Relating to ADL	MEC (*n* = 77)	WC (*n* = 77)
	% (*n*)	% (*n*)
House cleaning	U = 2410.5, p = 0.151	
Always	21.6 (16)	10.7 (8)
Frequently	12.1 29)	10.7 (8)
Sometimes	24.3 (18)	28.0 (21)
Rarely	8.1 (6)	12.0 (9)
Never	33.8 (25)	38.7 (29)
Looking after children	U = 1019, p = 0.239	
Always	4.2 (2)	4.2 (2)
Frequently	4.2 (2)	6.3 (3)
Sometimes	27.1 (13)	6.3 (3)
Rarely	2.1 (1)	10.4 (5)
Never	62.5 (30)	72.9 (35)
Preparing food	**U = 2330, p = 0.023**	
Always	14.3 (11)	9.1 (7)
Frequently	10.4 (8)	11.7 (9)
Sometimes	29.9 (23)	14.3 (11)
Rarely	13.0 (10)	14.3 (11)
Never	31.2 (24)	50.6 (39)
Not applicable	1.3 (1)	-
Personal care	U = 2909, p = 0.793	
Always	5.2 (4)	3.9 (3)
Frequently	2.6 (2)	-
Sometimes	9.1 (7)	11.7 (9)
Rarely	9.1 (7)	9.1 (7)
Never	74.0 (57)	75.3 (58)
Getting around the home	U = 2638, p = 0.161	
Always	-	5.2 (4)
Frequently	3.9 (3)	1.3 (1)
Sometimes	7.8 (6)	6.5 (5)

Table 3. *Cont.*

Support Needs Relating to ADL	MEC (*n* = 77)	WC (*n* = 77)
	% (*n*)	% (*n*)
Rarely	18.2 (14)	5.2 (4)
Never	68.8 (53)	81.8 (63)
Not applicable	1.3 (1)	-
Taking medicines	*U* = 2490, *p* = 0.083	
Always	11.7 (9)	6.5 (5)
Frequently	10.4 (8)	6.5 (5)
Sometimes	22.1 (17)	16.9 (13)
Rarely	7.8 (6)	11.7 (9)
Never	46.8 (36)	58.4 (45)
Getting dressed	*U* = 3042.5, *p* = 0.723	
Always	2.6 (2)	9.1 (7)
Frequently	1.3 (1)	3.9 (3)
Sometimes	14.3 (11)	9.1 (7)
Rarely	10.4 (8)	6.5 (5)
Never	71.4 (55)	71.4 (55)
Doing DIY around the house	*U* = 2141, *p* = 0.748	
Always	36.9 (24)	26.5 (18)
Frequently	10.8 (7)	20.6 (14)
Sometimes	21.5 (14)	23.5 (16)
Rarely	3.1 (2)	7.4 (5)
Never	27.7 (18)	22.1 (15)
Able to go out and do shopping	*U* = 3146.5, *p* = 0.480	
Completely	35.1% (27)	44.2% (34)
Somewhat	41.6% (32)	32.5% (25)
Not really	16.9% (13)	15.6% (12)
Not at all	6.5% (5)	7.8% (6)

MEC = Minority ethnic communities (excluding white minorities), and WC = White communities (including white minorities). Statistically significant results are shown in bold.

There was no statistically significant difference in the extent to which participants in the two groups felt *able to go out and go shopping*, with just over three-quarters in both groups feeling *completely* or *somewhat* able to do so. Although MEC participants were less likely than WC participants to feel *completely* able to do so (35.1% vs. 44.2%), more WC participants than MEC participants indicated that there was no need/no one supported them in doing so (31.2% and 19.5%). Spouses and partners were the most common providers of support with shopping in both groups. WC participants were significantly more likely to receive help from their spouse or partner (40.3% vs. 24.7% (X^2 = 4.26, *p* = 0.039, Cramer's V = 0.166)), while MEC participants were significantly more likely to get shopping delivered to them (19.5% vs. 7.8% (X^2 = 4.47, *p* = 0.035, Cramer's V = 0.170)). Although MEC participants were also twice as likely to receive support with shopping from other family members (20.8% vs. 10.4%), this did not reach statistical significance (X^2 = 3.16, *p* = 0.076).

For both MEC and WC participants, support for other ADL was most commonly provided by spouses and partners (40.3% vs. 52.2%; Table 4). MEC participants were significantly more likely to receive support from siblings (23.9% vs. 7.5% (X^2 = 6.83,

$p = 0.009$, Cramer's V = 0.226)) and other family members (14.9% vs. 3.0% ($X^2 = 5.86$, $p = 0.016$, Cramer's V = 0.209)). MEC participants were also more likely to report receiving support from their children (26.9% vs. 13.4%) and friends and neighbours (26.9% vs. 14.9%), although these differences did not reach statistical significance. In contrast, WC participants were more likely to receive no support/not need support (31.2% vs. 19.5%), but this was also not statistically significant. Formal support was much less common compared to informal support. None of the participants received support for ADL from charity workers or a district nurse/health visitor, only one person received support from social services, and a small number of MEC ($n = 7$) and WC participants ($n = 5$) received support from paid support workers.

Table 4. Sources of support for ADL and shopping, by subgroup.

Providing Support with ADL	MEC ($n = 77$)	WC ($n = 77$)		
	% (n)	% (n)	X^2 (1, $N = 154$)	*p*-Value
No one/Do not need support	19.5 (15)	31.2 (24)	2.78	0.095
Spouse/partner	40.3 (27)	52.2 (35)	1.92	0.166
Child/children	26.9 (18)	13.4 (9)	3.76	0.053
Parents	22.4 (15)	23.9 (16)	0.04	0.838
Siblings	23.9 (16)	7.5 (5)	**6.83, Cramer's V = 0.226**	**0.009**
Other family member	14.9 (10)	3.0 (2)	**5.86, Cramer's V = 0.209**	**0.016**
Friend or neighbour	26.9 (18)	14.9 (10)	2.89	0.089
Social services (e.g., social or rehabilitation workers)	1.5 (1)	1.5 (1)	Fisher's exact	1.000
District nurse/health visitor	-	-	-	
Charity workers (e.g., volunteers)	-	-	-	
Paid support workers	10.4 (7)	7.5 (5)	0.37	0.545
Someone else	9.0 (6)	14.9 (10)	1.14	0.287
Providing support with shopping			X^2 (1, $N = 154$)	
No one/Do not need support	19.5 (15)	31.2 (24)	2.78	0.095
Spouse/partner	24.7 (19)	40.3 (31)	**4.26, Cramer's V = 0.166**	**0.039**
Child/children	14.3 (11)	14.3 (11)	0.00	1.000
Parents	15.6 (12)	14.3 (11)	0.05	0.821
Other family member	20.8 (16)	10.4 (8)	3.16	0.076
Friend or neighbour	19.5 (15)	15.6 (12)	0.40	0.525
Support worker	9.1 (7)	3.9 (3)	1.71	0.191
Staff in store	11.7 (9)	9.1 (7)	0.28	0.597
Get shopping delivered	19.5 (15)	7.8 (6)	**4.47, Cramer's V = 0.170**	**0.035**
Volunteer/shopping helper	1.3 (1)	1.3 (1)	-	1.000
Someone else	2.6 (2)	1.3 (1)	-	1.000
Able to go out and do shopping			$U = 3146.5$	0.480
Completely	35.1% (27)	44.2% (34)		
Somewhat	41.6% (32)	32.5% (25)		
Not really	16.9% (13)	15.6% (12)		
Not at all	6.5% (5)	7.8% (6)		

MEC = Minority ethnic communities (excluding white minorities), and WC = White communities (including white minorities). Statistically significant results are shown in bold. Results for Fisher's exact tests are shown as *p*-values only.

Accessibility of information and communications is important for people with V.I. Although a larger proportion of MEC participants (40.3%) than WC participants (27.3%)

rated *Format of information provided by service providers* as *extremely important*, this was one of the few issues where differences did not reach statistical significance ($U = 2472.5$, $p = 0.079$; Table 2). Furthermore, although there were differences between MEC and WC participants in the proportions who were aware that they could request accessible information from health providers (34.1% vs. 51.3%), the bank (33.3% vs. 47.1%), or utility companies (32.5% vs. 47.2%), these were not statistically significant. Notably, while levels of awareness were lower among MEC participants, they were more likely to have requested accessible information from their health provider (43.9% vs. 36.2%), bank (49.1% vs. 36.2%), and utility company (38.6% vs. 29.8%). Again, these differences were not statistically significant (Table 5).

Table 5. Importance, awareness, and requests for information in an accessible format from service providers, by subgroup.

Importance, Awareness, and Requests for Information in Accessible Format from Service Providers	MEC	WC
Format of information provided by service providers	$U = 2472.5, p = 0.079$	
Extremely important	40.3 (31)	27.3 (21)
Very important	36.4 (28)	42.9 (33)
Somewhat important	18.2 (14)	22.1 (17)
Not important at all	3.9 (3)	7.8 (6)
Missing	1.3 (1)	-
Has requested information in accessible format from:		
Health providers	$p = 0.503$	
Yes	43.9 (25)	36.2 (17)
No	52.6 (30)	55.3 (26)
Not applicable	3.5 (2)	8.5 (4)
Bank	$p = 0.150$	
Yes	49.1 (28)	36.2 (17)
No	47.4 (27)	51.1 (24)
Not applicable	3.5 (2)	36.2 (17)
Utility providers	$p = 0.121$	
Yes	38.6 (22)	29.8 (14)
No	57.9 (33)	55.3 (26)
Not applicable	3.5 (2)	14.9 (7)
Is aware that information can be requested in accessible format from:		
Health providers	$X^2 (2, N = 80) = 5.52, p = 0.063$	
Yes	34.1 (14)	51.3 (20)
No	51.2 (21)	25.6 (10)
Do not want it	14.6 (6)	23.1 (9)
Bank	$X^2 (2, N = 67) = 3.47, p = 0.176$	
Yes	33.3 (11)	47.1 (16)
No	48.5 (16)	26.5 (9)
Do not want it	18.2 (6)	26.5 (9)

Table 5. *Cont.*

Importance, Awareness, and Requests for Information in Accessible Format from Service Providers	MEC	WC
Utility providers	X^2 **(2,** N **= 76) = 5.98,** p **= 0.050,** Cramer's V = 0.281	
Yes	32.5 (13)	47.2 (17)
No	55.0 (22)	27.8 (10)
Do not want it	12.5 (5)	25.0 (9)
Help required reading printed material	U = 3130.5, p = 0.538	
Always	10.4 (8)	6.5 (5)
Frequently	16.9 (13)	24.7 (19)
Sometimes	24.7 (19)	24.7 (19)
Rarely	24.7 (19)	27.3 (21)
Never	23.4 (18)	16.9 (13)
Difficulty reading instructions on medication	U = 2942.5, p = 0.835	
Very easy	3.9 (3)	6.5 (5)
Quite easy	19.5 (15)	18.2 (14)
Quite difficult	28.6 (22)	26.0 (20)
Very difficult	20.8 (16)	20.8 (16)
Impossible	27.3 (21)	26.0 (20)
Not applicable	-	2.6 (2)

MEC = Minority ethnic communities (excluding white minorities), and WC = White communities (including white minorities). Statistically significant results are shown in bold. Results for Fisher's exact tests are shown as *p*-values only.

As shown earlier, MEC participants were more likely to need help with taking medications. This may relate to difficulty reading instructions on medication. However, similar proportions of MEC and WC participants reported at least some degree of difficulty with this activity (76.7% vs. 72.8%; Table 5). Only approximately one-quarter of both groups found it easy to read instructions on medicines. Indeed, 3 in 10 MEC (27.3%) and WC participants (31.2%) reported that they *always* or *frequently* required help with reading printed material.

3.2. Navigation and Mobility Outside the Home

This section explores participants' experiences when leaving their homes and navigating their external environment. There were no statistically significant differences in participants' perceived ability to get out as often as they liked (U = 3146.5, p = 0.480), nor the extent to which they agreed that they felt able to get out and about independently in their local area (U = 3195, p = 0.357). However, the frequency with which participants in the two groups left their home was trending towards significance, although this was not statistically significant (U = 3420.5, p = 0.055). At least 9 in 10 participants in both groups left their house at least once a week and around 8 in 10 felt somewhat or completely able to get out as often as they liked, but MEC participants were less likely than WC participants to leave their home every day of the week (57.1% vs. 70.1%) and they were less likely to feel completely able to get out as often as they liked (39.0% vs. 44.2%). One MEC participant indicated that they did not leave their home at all, compared to none of the WC participants. Similar proportions in both groups (81.9% of MEC and 83.1% of WC) agreed that they felt able to get out and about independently in their local area, but the proportion who agreed strongly was marginally higher among WC (58.4%) than MEC participants (49.4%).

One issue relating to navigation is obstacles on the pavement. Although around half of MEC (48.1%) and a slightly lower proportion of WC participants (41.6%) reported that they *had been injured by obstacles outside* (X^2 (1, N = 154) = 0.66, p = 0.418), MEC participants were significantly more likely than WC participants to rate *reduction of obstacles and street clutter* (U = 2351, p = 0.024) as important. Around half of MEC participants (50.6%) rated this as *extremely important*, compared to 36.4% of WC participants (Table 6).

Table 6. Navigation and accessibility of external environments, by subgroup.

Navigation and Accessibility of External Environments	MEC (*n* = 77)	WC (*n* = 77)
	% (*n*)	% (*n*)
Accessibility of public transport (signage, announcement, training of drivers/staff)	U = 2333.5, p = 0.013	
Extremely important	61.0 (47)	37.7 (29)
Very important	26.0 (20)	44.2 (34)
Somewhat important	5.2 (4)	15.6 (12)
Not important at all	7.8 (6)	2.6 (2)
Design and accessibility of public buildings	U = 2005.5, p < 0.001	
Extremely important	48.1 (37)	19.5 (15)
Very important	36.4 (28)	46.8 (36)
Somewhat important	7.8 (6)	24.7 (19)
Not important at all	7.8 (6)	9.1 (7)
Reduction of obstacles and street clutter	U = 2351, p = 0.024	
Extremely important	50.6 (39)	36.4 (28)
Very important	35.1 (27)	36.4 (28)
Somewhat important	10.4 (8)	23.4 (18)
Not important at all	2.6 (2)	3.9 (3)
Missing	1.3 (1)	-
Frequency with which one leaves home	U = 3420.5, p = 0.055	
Every day	57.1 (44)	70.1 (54)
Every other day	15.6 (12)	15.6 (12)
A couple of times a week	15.6 (12)	10.4 (8)
At least once a week	5.2 (4)	-
At least once a fortnight	3.9 (3)	1.3 (1)
Less than once a fortnight	1.3 (1)	2.6 (2)
Do not leave home	1.3 (1)	-
Ability to get out as often as one would like	U = 3146.5, p = 0.480	
Completely	39.0 (30)	44.2 (34)
Somewhat	40.3 (31)	36.4 (28)
Not really	11.7 (9)	16.9 (13)
Not at all	9.1 (7)	2.6 (2)

Table 6. *Cont.*

Navigation and Accessibility of External Environments	MEC (*n* = 77)	WC (*n* = 77)
	% (*n*)	% (*n*)
I feel able to get out and about independently in my local area	U = 3195, *p* = 0.357	
Strongly agree	49.4 (38)	58.4 (45)
Slightly agree	32.5 (25)	24.7 (19)
Neither agree nor disagree	3.9 (3)	1.3 (1)
Slightly disagree	6.5 (5)	7.8 (6)
Strongly disagree	7.8 (6)	7.8 (6)
Has been injured by street obstacles	X^2 (1, N = 154) = 0.66, *p* = 0.418	
Yes	48.1 (37)	41.6 (32)
No	51.9 (40)	58.4 (45)
Use public transport as much as one would like	**X2 (2, *N* = 154) = 6.40, *p* = 0.041, Cramer's V = 0.204**	
Yes	49.4 (38)	68.8 (53)
No	39.0 (30)	26.0 (20)
Never travel by public transport	11.7 (9)	5.2 (4)

MEC = Minority ethnic communities (excluding white minorities), and WC = White communities (including white minorities). Statistically significant results are shown in bold. Results for Fisher's exact tests are shown as *p*-values only.

A further issue impeding outside navigation relates to the accessibility of public spaces, including public transport. Although over nine in ten participants in both groups rated navigation and mobility-related issues as at least *somewhat important*, there were, again, statistically significant differences (Table 6): 61.0% of MEC participants rated *Accessibility of public transport as extremely important*, compared to 37.7% of WC participants (U = 2333.5, *p* = 0.013), and a slightly lower proportion (48.1%) rated *Design and accessibility of public buildings as extremely important*, compared to 19.5% of WC participants (U = 2005.5, *p* < 0.001). Similarly, there was a significant difference between MEC and WC participants' *use of public transport as much as they would like* (X^2 (2, N = 154) = 6.40, *p* = 0.041, Cramer's V = 0.204). Over two-thirds (68.8%) of WC participants used public transport as much they wanted, compared to just under half of MEC participants (49.4%). Alternatively, MEC participants were more than twice as likely to *never* travel by public transport (11.7% vs. 5.2%).

3.3. Information and Technology

There are a number of aids that have been developed to facilitate reading for people with V.I. As seen in Table 7, there were no statistically significant differences in the use of different types of aids. Large-size text (electronic) was most commonly used by both MEC (62.3%) and WC participants (50.6%), followed by synthetic audio, i.e., speech output on computer/eBook, for MEC participants (54.5%), and audio with human voice, i.e., DAISY/talking books, for WC participants (44.2%). Comparatively few MEC and WC participants used paper-based braille (11.7% vs. 14.3%) or electronic braille (3.9% vs. 7.8%). WC participants were also more likely to use ordinary-size print (31.2% vs. 45.5%), but this did not reach statistical significance (X^2 = 3.32, *p* = 0.068).

Table 7. Aids used to access digital and printed information, by subgroup.

Aids Used to Access Digital and Printed Information	MEC (*n* = 77)	WC (*n* = 77)		
	% (*n*)	% (*n*)	X^2 (1, N = 154)	*p*-Value
Software used to make adjustments to help access PC/laptop/Tablet/smartphone:				
Magnification software	50.6 (39)	42.9 (39)	0.94	0.333
Screen reader software	29.9 (23)	31.2 (24)	0.03	0.861
Colour adjustments	19.5 (15)	19.5 (15)	0.00	1.00
Virtual assistants (e.g., Siri, Cortana)	29.9 (23)	26.0 (20)	0.29	0.590
Voice recognition software	27.3 (21)	22.1 (17)	0.56	0.455
Other	13.0 (10)	9.1 (7)	0.60	0.440
Do not make adjustments	15.6 (12)	24.7 (19)	1.98	0.159
Not stated	5.2 (4)	9.1 (7)	0.88	0.348
Aids used for reading:				
Ordinary-size print	31.2 (24)	45.5 (35)	3.32	0.068
Large-size print (hard copy)	46.8 (36)	39.0 (30)	0.95	0.329
Large-size text (electronic)	62.3 (48)	50.6 (39)	2.14	0.144
Paper-based braille	11.7 (9)	14.3 (11)	0.23	0.632
Electronic braille	3.9 (3)	7.8 (6)	-	0.459
Audio with human voice (e.g., DAISY, talking books)	46.8 (36)	48.1 (37)	0.03	0.872
Synthetic audio (e.g., speech output on computer, eBook)	54.5 (42)	44.2 (34)	1.66	0.197

MEC = Minority ethnic communities (excluding white minorities), and WC = White communities (including white minorities). Results for Fisher's exact tests are shown as *p*-values only.

Assistive technologies may provide another tool for people with V.I. to overcome some of the challenges relating to everyday tasks and navigation. While MEC participants were, again, statistically significantly more likely to rate *Better route planning and navigation aids* ($U = 1891.5$, $p < 0.001$), *Access and support to use the internet* ($U = 1874$, $p < 0.001$), *New smart technology and apps to support people with V.I.* ($U = 1914$, $p < 0.001$), *and Training to use technology to its full potential* ($U = 1845.5$, $p < 0.001$), as important, technology-related issues were of comparatively less importance to both groups (Table 8). Indeed, 41.6% (*use of internet*), 55.8% (*new smart tech/apps*), and 46.8% (*tech training*) of MEC participants rated these items as *extremely important*, compared to 16.9%, 20.8%, and 20.8% of WC participants. In addition, there was no statistically significant difference in the perceived importance of *Accessibility features of technology* ($U = 2527.5$, $p = 0.087$).

Table 7 shows the use of different types of software adjustments to help people with V.I. access technologies. There were, again, no statistically significant differences between the two groups in the *Adjustments they made to help access PC/laptop/Tablet/smartphone* technologies. Magnification software was commonly used by MEC (50.6%) and WC participants (42.9%), followed by screen reader software (29.9% and 31.2%) and virtual assistants (29.9% and 26.0%). Almost one-quarter of WC (24.7%) and 15.6% of MEC participants did not use any technology.

Table 8. Importance of technology-related issues, by subgroup.

Importance of Technology-Related Issues	MEC (*n* = 77)	WC (*n* = 77)
	% (*n*)	% (*n*)
Better route planning and navigation aids	*U* = 1891.5, *p* < 0.001	
Extremely important	46.8 (36)	20.8 (16)
Very important	37.7 (29)	39.0 (30)
Somewhat important	7.8 (6)	28.6 (22)
Not important at all	6.5 (5)	11.7 (9)
Missing	1.3 (1)	-
Access and support to use the Internet	*U* = 1874, *p* < 0.001	
Extremely important	41.6 (32)	16.9 (13)
Very important	40.3 (31)	36.4 (28)
Somewhat important	10.4 (8)	27.3 (21)
Not important at all	7.8 (6)	19.5 (15)
Training to use technology to its full potential	*U* = 1845.5, *p* < 0.001	
Extremely important	46.8 (36)	20.8 (16)
Very important	39.0 (30)	35.1 (27)
Somewhat important	10.4 (8)	35.1 (27)
Not important at all	3.9 (3)	9.1 (7)
Accessibility features of mainstream technology	*U* = 2527.5, *p* = 0.087	
Extremely important	40.3 (31)	29.9 (23)
Very important	46.8 (36)	46.8 (36)
Somewhat important	6.5 (5)	15.6 (12)
Not important at all	6.5 (5)	7.8 (6)
New smart tech and apps to support people with V.I.	*U* = 1914, *p* < 0.001	
Extremely important	55.8 (43)	20.8 (16)
Very important	26.0 (20)	45.5 (35)
Somewhat important	14.3 (11)	27.3 (21)
Not important at all	3.9 (3)	6.5 (5)

MEC = Minority ethnic communities (excluding white minorities), and WC = White communities (including white minorities). Statistically significant results are shown in bold. Results for Fisher's exact tests are shown as *p*-values only.

4. Discussion

This article provides an overview of the experiences of a matched control sample of MEC and WC adults with V.I. in relation to ADL, navigation outside the home, and information and technology.

4.1. Activities of Daily Living

Participants in both groups were generally self-reliant, with most not needing help with their personal care, getting around the home, getting dressed, looking after children, and going shopping. Activities that required the most support in both groups were DIY projects and house cleaning. This may reflect a lack of DIY skills in this sample rather than the impact of V.I. on functioning. There were group differences in the importance of issues relating to self-efficacy, with MEC participants rating both *Confidence in my ability to do everyday task* and the *Help and support to take care of myself and my home* as significantly

more important than the WC group. Although a statistically significant difference was only found for food preparation, MEC participants were more likely to frequently require support with a range of ADL, including food preparation, taking medication, and personal care, than WC, who were more likely than MEC to require help with getting around the home and getting dressed.

Previous research found that almost half of the people experiencing sight loss cannot cook for themselves, highlighting the need for support with cooking for people with V.I. [27]. The group differences in support needs relating to food preparation found in the current sample may reflect cultural differences in cooking habits, whereby food preparation is more elaborate and plays a bigger part among MEC [28]. Support needs for taking medication and getting around the home have previously been identified among older people with V.I. [29,30]. Although not statistically significant, MEC were more likely to need help with the former. Around three-quarters of MEC (76.6%) and WC participants (72.7%) in this sample reported difficulties reading instructions on medication. There is evidence of poorer treatment adherence among MEC [31]. This is important, because people from MEC have a greater risk of some eye and other health conditions that may be managed with medication. For example, people from Afro-Caribbean communities may be at greater risk of glaucoma [32], which may be managed with medicated eye drops [33,34].

When asked who supported them with ADL and shopping, WC were more likely to state no one or that they did not need support. This response option was ambiguous because it was not clear if people do not need support or have no one to support them. The findings showed the extent to which both groups rely on informal rather than formal support. Very few participants were in receipt of formal support provided by charities, social services, or health professionals to help with ADL and shopping. It is unclear if this is because participants were not eligible for, did not want, or did not have, access to formal support where they were. Spouses/partners were the most common source of support in both groups. Interestingly, MEC were around twice as likely to report receiving support from their children (26.9% and 13.4%, respectively) and other family members (20.8% vs. 10.4%), and over three times more likely to receive support from siblings compared to WC participants (23.9% and 7.5%, respectively). This may reflect cultural differences in the attitudes towards family roles and caregiving. Research with people with dementia found that providing care was considered a family obligation, especially for the children, and sometimes even a religious duty among MEC [35]. However, research with members of Somali refugee communities found that some participants felt reluctant to ask family members for support, or more comfortable asking a daughter for support than a son [36]. Future research could explore the role of family in caregiving, the role of gender in family caregiving, and the extent to which this wider informal support network meets the needs of MEC adults with V.I.

Although around 8 in 10 MEC (76.6%) and WC participants (83.1%) required help with reading printed material, only a relatively small proportion were aware of, or had requested, information from health providers, banks, and utility companies in an accessible format. MEC participants were slightly less likely to be aware that they could receive this information in an accessible format. This may be exacerbated by the language needs of MEC not being met when accessing, for instance, health services [37]. It should be noted that *Format of information provided by service providers* was of comparatively less importance than other issues [22].

4.2. Navigation and Mobility Outside the Home

Although MEC participants left their home marginally less frequently than WC participants, there were no statistically significant differences in participants' perceived ability to get out as much as they wanted to and to get out of their home independently in their local area. This may reflect the positive effect of familiar places on navigation for people with V.I. [38], while accessibility may have a negative impact on navigation.

Injuries due to obstacles in the urban environment are not uncommon for people with V.I. [39]. A UK survey with 500 respondents with V.I. found that 95% had collided with obstacles on the pavement in the past 3 months: 70% had collided with cars parked on pavements, 64% with bins, 59% with permanent and 55% with temporary street furniture, and 49% with advertising boards [40]. In the current sample, 48.1% of MEC and 41.6% of the WC participants had been injured by street obstacles in the past year. Unsurprisingly, *Reduction of obstacles and street clutter* was highly important to both groups, although it was once again significantly more important in the MEC than WC group. Thus, reducing barriers in the environment is especially essential to the safe and independent travel of a person with V.I. [41], and better maintenance of pavements is required to prevent people from falling while outside [30].

Similarly, issues relating to the accessibility of public environments, particularly public transport, emerged as a key priority among all groups [22]. However, *Accessibility of public transport* and *Design and accessibility of public buildings* were rated as significantly more important by MEC participants compared to their WC counterparts. This reflected statistically significant differences in participants' use of public transport: over two-thirds of WC participants indicated that they used public transport as much as they wanted, compared to only around half of MEC participants. Moreover, almost 2 in 5 MEC participants were not able to use public transport as much as they liked compared to just over one-quarter of WC participants. Previous research found that people from MEC are significantly more likely to use public transport [42]. However, a US web survey with people with a range of disabilities, including V.I., found that non-white respondents reported a significantly higher frequency of problems when using public transport to go to work or school, while Hispanic respondents (compared to non-Hispanic respondents) reported more frequent issues when using public transport to go to work/school, run errands, access healthcare, socialise, and for spontaneous activities [43]. In addition, respondents with V.I. noted a significantly higher frequency of issues when using public transport to access health services, run errands, and for socialising compared to respondents with other types of disabilities. The V.I. Lives survey did not explore reasons why participants felt they were not able to use public transport as much as they liked. While this may be due to comorbidities, such as mobility issues among MEC, particularly black, participants [23], other factors, such as cost, availability, discrimination, and, indeed, accessibility, may also impact public transport use. Transportation issues have been identified as barriers to employment [44], participation in physical activity [45], and use of health services, e.g., health screenings for diabetic retinopathy [46]. Understanding the reasons for lower public transport use among MEC participants is, therefore, of vital importance. The V.I. Lives survey did not explore experiences of accessing public buildings; however, at least 3 in 10 people with disabilities in the UK have reported that negative attitudes and behaviours have prevented them from using public transport, work, going shopping, and socialising, and around 1 in 5 had been impacted by the negative attitudes of employers (28%) and colleagues (20%), the general public (24%), health, social care, and support staff (19%), transport staff (16%), and retail staff (14%) [47].

Independent mobility has been found to have a positive impact on the well-being of people with V.I. and other disabilities [48]. Reducing barriers in the environment and improving the accessibility of public transport and buildings may help to improve independent mobility.

4.3. Technology

As indicated earlier, assistive technologies (ATs) can assist with navigation [13], object recognition, information access, and social interactions [14]. There were no statistically significant group differences in the use of a range of software and reading aids.

In both groups, magnification software was the most common aid used to access digital information, while large-size text (electronic), followed by synthetic audio, audio with human voice, and large-size print (hard copy), were the most common aids used to access

reading and information. MEC participants rated technology-related issues significantly more important than WC participants, including *Better route planning and navigation aids, Access and support to use the internet, Training to use technology to its full potential,* and *New smart technology and apps to support people with V.I.* In addition, *although Accessibility features of mainstream technology* was one of the few issues for which a significant difference was not found, 40.3% of MEC participants rated this as *extremely important*, compared to 29.9% of WC participants. Considering the significantly higher importance of almost all issues among the MEC group, it is possible that this reflects differences in response style rather than priorities or needs. While the survey did not explore the extent to which participants were familiar with different types of aids, around a quarter of WC (24.7%) and 15.6% of MEC participants did not use any technology to access digital information. This may be for a variety of reasons, including because they do not need it, are not aware of it, do not know how to use it, do not want to use it, or have other means of accessing the information. In this context, it should be noted that this was a relatively young sample, and thus some of the barriers to technology use associated with older adults may not apply [49]. Considering the positive impact of adopting assistive technologies by people with V.I. on their quality of life [50–54], future research may need to explore how their uptake and use can be supported.

4.4. Limitations

This study used data from a relatively small convenience sample of UK adults. Findings cannot, therefore, be extrapolated to the wider V.I. population. The MEC group consists of diverse communities that may have very different experiences. Moreover, non-English speakers, who may have specific support needs relating to accessibility and functioning, were excluded from the survey. While the majority of the sample was recruited through the Acumen health database, a small proportion was recruited through V.I. charities, whose beneficiaries may be receiving support relating to accessibility and functioning. WC participants were matched to MEC participants based on age, gender, UK region, and urban/rural setting. Other variables, such as employment status or education, could have been used to match participants, which may have yielded different results. As noted earlier, there were issues relating to the clarity of the survey questions or response options, and this was evidenced by the ambiguity of the "no one/do not need" response when asked who provided support. The V.I. Lives survey explored a wide range of issues. As a result, topics could not always be explored in depth. For instance, the familiarity and use or non-use of different ATs would have been useful to understand gaps in knowledge.

5. Conclusions

This article provided a preliminary overview of functioning relating to ADL, navigation outside the home, and use of technology to access information among adults with V.I. from MEC and WC. Overall, issues relating to these areas tended to be significantly more important to MEC than WC adults, although there were fewer statistically significant differences in status. MEC participants were significantly more likely to require regular help with cooking, to receive support for their wider family, including siblings and other family members, and to have their shopping delivered. Furthermore, MEC participants had regular help available, and as the results show, they had more social support at their disposal, and were able to take care of children. While not statistically significant, MEC participants needed more help with taking medications, which may be vital to manage their eye and other health conditions. WC participants were significantly more likely to have help from their spouse/partner with shopping and to use public transport as much as they liked. Future research will need to confirm these findings in a larger sample and explore the reasons behind differences in areas such as use of public transport and support networks.

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