Section 2

Demographics

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Participants

In this PEEK study, a total of 36 participants were recruited into the study, 18 participants with NMOSD (50.00%), eight participants (22.22%) with MOG and 10 family members or carers to people with NMOSD or MOG (27.78%).

Participants with NMOSD

There were 18 people with NMOSD who took part in this study, the majority were females (n=16, 88.89%). Participants were most commonly aged between 45 to 64 years (n=10, 55.56%).

Participants with NMOSD were most commonly from New South Wales (n=7, 38.89%), Queensland (n=6, 33.33%), or Victoria (n=3, 16.67%). Most participants lived in major cities (n= 15, 83.33%), and they lived in all levels of advantage, defined by Socio-economic Indexes for Areas (SEIFA) (<u>www.abs.gov.au</u>) with 12 participants (66.67%) from an area with a high SEIFA score of 7 to 10 (more advantage), and six participants (33.33%) from an area of mid to low SEIFA scores of 1 to 6 (less advantage).

Less than half of the participants with NMOSD had completed at least some university (n=8, 44.44%). There were seven participants (38.89%) who were employed either full time (n=5, 27.78%), or part time (n=2, 11.11%). There were six participants (33.33%) who were disabled and unable to work, and three participants (16.67%) who were retired. Almost a third of the participants were carers to family members or spouses (n=5, 27.78%).

Other health conditions

Participants with NMOSD reported between zero and 12 other conditions that they had to managed, with a median of 4.00 other conditions (IQR = 2.00) (Table 2.3, Figure 2.2).

The most commonly reported health condition by participants with NMOSD was chronic pain, (n=14, 77.78%), this was followed by sleep problems (n=11, 61.11%) and depression, either self-diagnosed or diagnosed by a doctor (n=9, 50.00%) (Table 2.4, Figure 2.3).

Baseline health

The Short Form Health Survey 36 (SF36) measures baseline health, or the general health of an individual. The SF36 comprises nine scales: physical functioning, role functioning/physical, role functioning/emotional, energy and fatigue, emotional well-being, social function, pain, general health, and health change from one year ago. The scale ranges from 0 to 100, a higher score denotes better health or function.

SF36 Physical functioning scale measures health limitations in physical activities such as walking, bending, climbing stairs, exercise, and housework. On average, physical activities were moderately limited.

SF36 Role functioning/physical scale measures how physical health interferes with work or other activities. On average, physical health interfered quite a lot with work or other activities.

SF36 Role functioning/emotional scale measures how emotional problems interfere with work or other activities. On average, emotional problems interfered quite a lot with work or other activities.

SF36 Energy/fatigue scale measures the proportion of energy or fatigue experienced. On average, participants had poor energy and a lot of fatigue.

The **SF36 Emotional well-being** scale measures how a person feels, for example happy, calm, depressed or anxious. On average, participants felt happy and calm some of the time, and anxious and depressed some of the time.

The **SF36 Social functioning** scale measures limitations on social activities due to physical or emotional problems. On average, social activities were moderately limited.

The **SF36 Pain** scale measures how much pain, and how pain interferes with work and other activities. On average, participants had moderate pain.

The **SF36 General health** scale measures perception of health. On average, participants reported poor health.

The **SF36 Health change** scale measures health compared to a year ago. On average, participants have health that is somewhat worse now compared to one year ago.

Participants

In this PEEK study, a total of 36 participants were recruited into the study, 18 participants with NMOSD (50.00%), eight participants (22.22%) with MOG and 10 family members or carers to people with NMOSD or MOG (27.78%) (Table 2.1, Figure 2.1).

Table 2.1: Participants

Participants	Number (n=36)	Percent
NMOSD	18	50.00
MOG	8	22.22
Family and carers	10	27.78

Demographics

Participants with NMOSD

There were 18 people with NMOSD who took part in this study, the majority were females (n=16, 88.89%). Participants were most commonly aged between 45 to 64 years (n=10, 55.56%).

Participants were most commonly from New South Wales (n=7, 38.89%), Queensland (n=6, 33.33%), or Victoria (n=3, 16.67%). Most participants lived in major cities (n= 15, 83.33%), and they lived in all levels of advantage, defined by Socio-economic Indexes for Areas (SEIFA) (www.abs.gov.au) with 12 participants (66.67%) from an area with a high SEIFA score of 7 to 10 (more advantage), and six participants (33.33%) from an area of mid to low SEIFA scores of 1 to 6 (less advantaged).

Less than half of the participants had completed at least some university (n=8, 44.44%). There were seven participants (38.89%) who were employed either full time (n=5, 27.78%), or part time (n=2, 11.11%). There were six participants (33.33%) who were disabled and unable to work, and three participants (16.67%) who were retired.

Almost a third of the participants were carers to family members or spouses (n=5, 27.78%). The demographics of participants with NMOSD are listed in Table 2.2.

Participants with MOG

There were eight people with MOG who took part in this study, the majority were females (n=5, 62.50%).



Figure 2.1: Participants

Half of the participants were aged between 45 to 54 years (n=4, 50.00%).

Participants were most commonly from New South Wales (n=3, 37.50%), or Victoria (n=2, 25.00%). Most participants lived in major cities (n= 6, 75.00%), and they lived in all levels of advantage, defined by Socio-economic Indexes for Areas (SEIFA) (www.abs.gov.au) with five participants (62.50%) from an area with a high SEIFA score of 7 to 10 (more advantage), and three participants (37.50%) from an area of mid to low SEIFA scores of 1 to 6 (less advantaged).

Most of the participants had completed at least some university (n=5, 62.50%). Half of the participants with MOG were employed either full or part time (n=4, 50.00%).

Half of the participants were carers to family members or spouses (n=4, 50.00%). The demographics of participants with MOG are listed in Table 2.2.

Family and carers

There were 10 family members or carers of people with NMOSD or MOG who took part in this study, the majority were female (n=8, 80.00%), and were most commonly aged 55 to 64 (n=6, 60.00%).

The majority of carers lived in major cities (n=8, 80.00%), and most commonly lived in NSW (n=3, 30.00%). The demographics of carers are listed in Table 2.2.

Table 2.2: Demographics

Demographics	Definition	Participants w	vith NMOSD	Participants	Participants with MOG		th NMOSD or G	Family and carers	
		Number (n=18)	Percent	Number (n=8)		Number (n=26)	Percent	Number (n=10)	Percent
Gender	Female	16	88.89	5	62.50	21.00	80.77	8	80.00
	Male	2	11.11	3	37.50	5.00	19.44	2	20.00
Age	18 to 34	3	16.67	0	0.00	3.00	8.33	0	0.00
	35 to 44	4	22.22	2	25.00	6.00	16.67	2	20.00
	45 to 54	5	27.78	4	50.00	9.00	25.00	2	20.00
	55 to 64	5	27.78	1	12.50	6.00	16.67	6	60.00
	65 to 74	1	5.56	1	12.50	2.00	5.56	0	0.00
	75 or older	0	0.00	0	0.00	0.00	0.00	0	0.00
Location	Major cities	15	83.33	6	75.00	21.00	80.56	8	80.00
	Inner regional	1	5.56	2	25.00	3.00	13.89	2	20.00
	Outer regional	2	11.11	0	0.00	2.00	5.56	0	0.00
State	Australian Capital Territory	1	5.56	1	12.50	2.00	11.11	2	20.00
	New South Wales	7	38.89	3	37.50	10.00	36.11	3	30.00
	Queensland	6	33.33	0	0.00	6.00	19.44	1	10.00
	South Australia	0	0.00	1	12.50	1.00	2.78	0	0.00
	Victoria	3	16.67	2	25.00	5.00	19.44	2	20.00
	Western Australia	1	5.56	1	12.50	2.00	11.11	2	20.00
Socio-Economic Indexes for Areas (SEIFA)	1 to 2	2	11.11	3	37.50	5.00	16.67	1	6.00
	3 to 4	0	0.00	1	12.50	1.00	5.56	1	2.00
	5 to 6	4	22.22	1	12.50	5.00	22.22	3	8.00
	7 to 8	4	22.22	2	25.00	6.00	22.22	2	8.00
	9 to 10	8	44.44	1	12.50	9.00	33.33	3	12.00
Race/ethnicity	Caucasian/white	14	77.78	7	87.50	21.00	80.56	8	80.00
	Other	4	22.22	1	12.50	5.00	19.44	2	20.00
Education	Less than high school degree	3	16.67	1	12.50	4.00	16.67	2	20.00
	High school degree or equivalent	3	16.67	2	25.00	5.00	13.89	0	0.00
	Some college but no degree	1	5.56	0	0.00	1.00	8.33	2	20.00
	Trade	3	16.67	0	0.00	3.00	8.33	0	0.00
	Associate degree	0	0.00	0	0.00	0.00	2.78	1	10.00
	Bachelor degree	7	38.89	3	37.50	10.00	30.56	1	10.00
	Graduate degree	1	5.56	2	25.00	3.00	19.44	4	40.00
Employment	Employed, working full time	5	27.78	3	37.50	8.00	36.11	5	50.00
	Employed, working part time	2	11.11	1	12.50	3.00	13.89	2	20.00
	Full/part time study	1	5.56	0	0.00	1.00	5.56	1	10.00
	Full/part time carer	1	5.56	0	0.00	1.00	5.56	1	10.00
	Not employed, looking for work	0	0.00	1	12.50	1.00	2.78	0	0.00
	Receiving Centrelink support	2	11.11	1	12.50	3.00	11.11	1	10.00
	Disabled, not able to work	6	33.33	1	12.50	7.00	19.44	0	0.00
	Retired	3	16.67	1	12.50	4.00	11.11	0	0.00
Carer status	I am not a carer	13	72.22	4	50.00	0.00	0.00	17	47.22
	Children	4	22.22	4	50.00	4.00	40.00	12	33.33
	Parents	1	5.56	0	0.00	0.00	0.00	1	2.78
	Spouse	1	5.56	0	0.00	6.00	60.00	7	19.44

Other health conditions

Participants were asked about health conditions, other than NMOSD or MOG, that they had to manage. Participants could choose from a list of common health conditions and could specify other conditions (Table 2.4, Figure 2.3).

Participants with NMOSD

Participants with NMOSD reported between zero and 12 other conditions that they had to managed, with a median of 4.00 other conditions (IQR = 2.00) (Table 2.3, Figure 2.2).

The most commonly reported health condition was chronic pain, (n=14, 77.78%), this was followed by sleep problems (n=11, 61.11%) and depression, either self-diagnosed or diagnosed by a doctor (n=9, 50.00%) (Table 2.4, Figure 2.3).

Participants with MOG

Participants with MOG reported between one and eight other conditions that they had to managed, with a median of 4.00 other conditions (IQR = 3.50) (Table 2.3, Figure 2.2).

The most commonly reported health conditions were sleep problems (n=6, 75.00%), this was followed by chronic pain (n=5, 62.50%) (Table 2.4, Figure 2.3).

Family and carers

Family and cares reported between zero and four health conditions (median = 2.00, IQR = 2.75). The most commonly diagnosed condition was anxiety (n=3, 30.00%) (Table 2.3, Figure 2.2).

Table 2.3: Number of other health conditions



Figure 2.2: Number of other health conditions



Other health conditions	Participants	with NMOSD	Participants with MOG		Participants with	NMOSD or MOG	Family and carers	
	Number (n=18)	Percent	Number (n=8)		Number (n=26)	Percent	Number (n=10)	Percent
Chronic pain	14	77.78	5	62.50	19	73.08	0	0.00
Sleep problems or insomnia	11	61.11	6	75.00	17	65.38	2	20.00
Depression (Self or doctor diagnosed)	9	50.00	2	25.00	11	42.31	1	10.00
-Depression (Self diagnosed)	4	22.22	0	0.00	4	15.38	1	10.00
-Depression (Diagnosed by a doctor)	5	27.78	0	0.00	5	19.23	1	10.00
Anxiety (Self or doctor diagnosed)	7	38.89	3	37.50	10	38.46	3	30.00
-Anxiety (self diagnosed)	2	11.11	0	0.00	2	7.69	3	30.00
 -Anxiety (diagnosed by a doctor) 	5	27.78	0	0.00	5	19.23	0	0.00
Arthritis	7	38.89	2	25.00	9	34.62	1	10.00
High cholesterol	4	22.22	2	25.00	6	23.08	2	20.00
Atrial fibrillation or arrhythmias	1	5.56	2	25.00	3	11.54	1	10.00
Asthma	0	0.00	2	25.00	2	7.69	1	10.00
Diabetes	2	11.11	0	0.00	2	7.69	1	10.00
Stroke	2	11.11	0	0.00	2	7.69	0	0.00
Cancer	0	0.00	2	25.00	2	7.69	1	10.00
Hypertension	1	5.56	0	0.00	1	3.85	2	20.00
Chronic heart failure	1	5.56	0	0.00	1	3.85	0	0.00
Angina	1	5.56	0	0.00	1	3.85	0	0.00
COPD	0	0.00	1	12.50	1	3.85	0	0.00
Chronic kidney disease	0	0.00	0	0.00	0	0.00	0	0.00
Participants with other specified health conditions	7	38.89	4	50.00	11	42.31	3	30.00



Figure 2.3: Other health conditions

Subgroup analysis

Subgroup analysis are included throughout the study and the subgroups are listed in Table 2.5.

Participant type were grouped according to diagnosis of NMOSD, MOG, and family and carers; the *NMOSD* group includes participants who had a NMOSD diagnosis, (n=18, 50.00%), participants who had a MOG diagnosis were included in the *MOG* group (n=8, 22.22%), participants in the *NMOSD* or

MOG groups were included in the *NMOSD* and *MOG* subgroup (n=26, 72.22), and family members or carers of people with NMOSD or MOG were included in the *Family and carers* subgroup (n=10, 27.78%).

Comparisons were made by NMOSD **relapses**, those less than two relapses were included in the *fewer relapses* subgroup (n=9, 50.00%), and those that had three or more relapses, in the *more relapses* subgroup (n=9, 50.00%). Only participants with NMOSD were included in this comparison.

The Fear of Progression questionnaire measures the level of anxiety people experience in relation to their conditions. The Fear of Progression questionnaire comprises a total score, between 12 and 60, with a higher score denoting increased anxiety. Participants that scored over 41 in the fear of progression questionnaire were included in the High to very high fear subgroup (n=10, 55.56%), and those that scored less than 41 were included in the Low to moderate fear subgroup (n=8, 44.44%). Only participants with NMOSD were included in this comparison.

The SF36 Physical functioning scale measures health limitations in physical activities such as walking, bending, climbing stairs, exercise, and housework. Comparisons were made by **physical function**, participants that scored in the lowest three quintiles of the SF36 Physical functioning scale were included in the *Moderate to very poor physical function* subgroup (n=9, 50.00%), and participants that scored in the highest two quintiles were included in the *Good to very good physical function* subgroup (n=9, 50.00%). Only participants with NMOSD were included in this comparison.

Comparisons were made by **Education** status, between those with trade or high school qualifications, *trade or high school* (n=10, 55.56%), and those with a university qualification, *University* (n= 8, 44.44%). Only participants with NMOSD were included in this comparison.

Comparisons were made by **socioeconomic status**, using the Socio-economic Indexes for Areas (SEIFA) (www.abs.gov.au), SEIFA scores range from 1 to 10, a higher score denotes a higher level of advantage. Participants with a mid to low SEIFA score of 1 to 6, *Mid to low status* (n=6, 33.33%) compared to those with a higher SEIFA score of 7 to 10, *Higher status* (n=12, 66.67%) . Only participants with NMOSD were included in this comparison.

Participants were grouped according to **age**, with comparisons made between participants *Aged 18 to* 44 (n=7, 38.89%), , and *Aged 45 or older* (n=11, 61.11%). Only participants with NMOSD were included in this comparison.

There were 16 females (n=16, 88.89%) with NMOSD, however, there were too few males (n=2, 11.11%) for comparisons to be made. Data by **gender** is displayed for NMOSD participants throughout the study, but no analysis conducted.

The **location** of participants was evaluated by postcode using the Australian Statistical Geography Maps (ASGS) Remoteness areas accessed from the Australian Bureau of Statistics. There were 15 participants with NMOSD (83.33%) that lived in *Metropolitan* areas, however, too few participants with NMOSD lived in *Regional or remote* areas (16.67%) for comparisons to be made. Data by **location** is displayed for NMOSD participants throughout the study, but no analysis conducted.

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Subgroup	Characteristic	Number (n=18)	Percent
Participant type (n=36)	NMOSD	18	50.00
	MOG	8	22.22
	NMOSD and MOG	26	72.22
	Family and carers	10	27.78
Relapses	Fewer relapses	9	50.00
· · ·	More relapses	9	50.00
Fear of progression	Low to moderate fear	8	44.44
	High to very high fear	10	55.56
Physical function	Moderate to very poor physical function	9	50.00
	Good to very good physical function	9	50.00
Education	Trade or high school	10	55.56
	University	8	44.44
Socioeconomic advantage	Mid to low status	6	33.33
	Higher status	12	66.67
Age	Aged 18 to 44	7	38.89
	Aged 45 or older	11	61.11
Gender	Female	16	88.89
	Male	2	11.11
Location	Regional or remote	3	16.67
	Metropolitan	15	83.33

Table 2.5: Subgroups

Baseline health

The Short Form Health Survey 36 (SF36) measures baseline health, or the general health of an individual. The SF36 comprises nine scales: physical functioning, role functioning/physical, role functioning/emotional, energy and fatigue, emotional well-being, social function, pain, general health, and health change from one year ago. The scale ranges from 0 to 100, a higher score denotes better health or function.

Summary statistics for the entire cohort are displayed alongside the possible range of each scale in Table 2.6, for scales that had a normal distribution, the mean and SD should be used as an average measure.

The overall scores for the cohort were in the middle of the scale for **SF36 Physical functioning** (mean = 53.61, SD = 31.98), **SF36 Emotional well-being** (mean = 57.56, SD = 24.85), **SF36 Social functioning** (mean = 47.92, SD = 22.79), and **SF36 Pain** (mean = 43.06, SD = 30.07). This indicates moderate physical function, emotional well-being, social functioning, and pain.

he overall scores for the cohort were in the second lowest quintile for **SF36 Energy/Fatigue** (mean = 28.33, SD = 20.72), **SF36 General health** (mean = 32.78, SD = 23.65), and **SF36 Health change** (median = 37.5, IQR = 43.75) indicating poor energy/fatigue, general health and worse health than a year ago.

The overall scores for the cohort were in the lowest quintile for **SF36 Role functioning/physical** (median = 0, IQR = 87.5), and **SF36 Role functioning/emotional** (median = 0, IQR = 66.67) indicating that physical and emotional health interfered quite a bit with work or other activities.

Comparisons of SF36 have been made based on **participant type** (Tables 2.7 to 2.12, Figures 2.4 to 2.12), **relapses** (Tables 2.13 to 2.14, Figures 2.13 to 2.21), **fear of progression** (Tables 2.15 to 2.16, Figures 2.22 to 2.30), **physical function** (Tables 2.17 to 2.18, Figures 2.31 to 2.38), **education**, (Tables

2.19 to 2.20, Figures 2.39 to 2.47), socioeconomic status (Table 2.21 to 2.22, Figures 2.48 to 2.56), age (Tables 2.23 to 2.24, Figures 2.57 to 2.65), gender (Table 2.25), and location (Tables 2.26).

SF36 Physical functioning scale measures health limitations in physical activities such as walking, bending, climbing stairs, exercise, and housework. On average, physical activities were moderately limited.

SF36 Role functioning/physical scale measures how physical health interferes with work or other activities. On average, physical health interfered quite a lot with work or other activities.

SF36 Role functioning/emotional scale measures how emotional problems interfere with work or other activities. On average, emotional problems interfered quite a lot with work or other activities.

SF36 Energy/fatigue scale measures the proportion of energy or fatigue experienced. On average, participants had poor energy and a lot of fatigue.

The **SF36 Emotional well-being** scale measures how a person feels, for example happy, calm, depressed or anxious. On average, participants felt happy and calm some of the time, and anxious and depressed some of the time.

The **SF36 Social functioning** scale measures limitations on social activities due to physical or emotional problems. On average, social activities were moderately limited.

The **SF36 Pain** scale measures how much pain, and how pain interferes with work and other activities. On average, participants had moderate pain.

The **SF36 General health** scale measures perception of health. On average, participants reported poor health.

The **SF36 Health change** scale measures health compared to a year ago. On average, participants have health that is somewhat worse now compared to one year ago.

Table 2.6: SF36 summary statistics

SF36 scale (n=18)	Mean	SD	Median	IQR	Possible range	Quintile
Physical functioning*	53.61	31.98	62.50	53.75	0 to 100	3
Role functioning/physical	30.56	45.82	0.00	87.50	0 to 100	1
Role functioning/emotional	31.48	43.49	0.00	66.67	0 to 100	1
Energy/Fatigue*	28.33	20.72	27.50	25.00	0 to 100	2
Emotional well-being*	57.56	24.85	62.00	34.00	0 to 100	3
Social functioning*	47.92	22.79	50.00	37.50	0 to 100	3
Pain*	43.06	30.07	45.00	42.50	0 to 100	3
General health*	32.78	23.65	32.50	32.50	0 to 100	2
Health change	43.06	35.15	37.50	43.75	0 to 100	2

*Normal distribution, use mean and SD as average measure

Comparisons of SF36 scales by participant type

Participant type were grouped according to diagnosis of NMOSD, MOG, and family and carers; the *NMOSD* group includes participants who had a NMOSD diagnosis, (n=18, 50.00%), participants who had a MOG diagnosis were included in the *MOG* group (n=8, 22.22%), participants in the *NMOSD* or *MOG* groups were included in the *NMOSD* and *MOG* subgroup (n=26, 72.22), and family members or carers of people with NMOSD or MOG were included in the *Family and carers* subgroup (n=10, 27.78%).

Boxplots of each SF36 scale by **participant type** are displayed in Figures 2.4 to 2.12, summary statistics are displayed in Tables 2.7, 2.9, and 2.11.

A one-way ANOVA test was used when the assumptions for response variable residuals were normally distributed and variances of populations were equal (Table 2.7). A Tukey HSD test was used post hoc to identify the source of any differences identified in the one-way ANOVA test (Table 2.8).

When the assumptions for normality of residuals was not met, a Kruskal-Wallis test was used (Table 2.9). Post hoc pairwise comparisons using Wilcoxon rank sum test was used to identify the source of any differences identified in the Kruskal -Wallis test (Table 2.10).

When the assumption of equal variances were not met, a Welch one-way test was used with post hoc pairwise t-tests with no assumption of equal variances (Tables 2.11 to 2.12).

A one way ANOVA test indicated a statistically significant difference in the **SF36 Energy/fatigue** scale between groups, F(3,58)=6.23, p=0.0010 (Table 2.7). Post hoc comparisons using the Tukey HSD test indicated that the mean score for participants in the *Family and carers* subgroup (mean=56.00, SD=23.78) was significantly higher compared to participants in the *NMOSD* (mean=28.33, SD=20.72, p=0.0047), *MOG* (mean =

22.50, SD=15.35, p=0.0044), and *NMOSD and MOG* (mean=26.54, SD=19.12, p=0.0012) subgroups (Table 2.8).

A one way ANOVA test indicated a statistically significant difference in the **SF36 Social functioning** scale between groups, F(3,58)=4.67, p=0.0055) (Table 2.7). Post hoc comparisons using the Tukey HSD test indicated that the mean score for participants in the *Family and carers* subgroup (mean=78.75, SD=23.61) was significantly higher compared to participants in the *NMOSD* (mean=47.92, SD=22.79, p=0.0048), and *NMOSD and MOG* (mean=51.92, SD=22.27, p=0.0107) subgroups (Table 2.8).

A Kruskal-Wallis test indicated a statistically significant difference in the **SF36 Physical functioning** scale between groups, $\chi^2(3)=14.80$, p=0.0020 (Table 2.9). Wilcoxon rank sum tests between groups indicated that participants in the *Family and carers* subgroup (median=92.50, IQR=12.50) was significantly higher compared to participants in the *NMOSD* (median=62.50, IQR=53.75, p=0.0045), *MOG* (median=35.00, IQR=56.25, p=0.0073), and *NMOSD and MOG* (median=57.50, IQR=57.50, p=0.0027) subgroups (Table 2.10).

A Kruskal-Wallis test indicated a statistically significant difference in the SF36 Role **functioning/physical** scale between groups, $\chi^{2}(3)=13.70$, p=0.0033 (Table 2.9). Wilcoxon rank sum tests between groups indicated that participants in the Family and carers subgroup (median=100.00,IQR =0.00) was significantly higher compared to participants in the NMOSD (median=0.00, IQR=87.50, p=0.0098), MOG (median=0.00, IQR=12.50, p=0.0098), and NMOSD and MOG (median=0.00, IQR=50.00, p=0.0065) subgroups (Table 2.10).

A Kruskal-Wallis test indicated a statistically significant difference in the **SF36 Role** functioning/emotional scale between groups,

 $\chi^2(3)=10.74$, p=0.0132 (Table 2.9). Wilcoxon rank sum tests between groups indicated that participants in the *Family and carers* subgroup (median=100.00, IQR =25.00) was significantly higher compared to participants in the *NMOSD* (median=0.00, IQR=66.67, p=0.0370) subgroup (Table 2.10).

A Kruskal-Wallis test indicated a statistically significant difference in the **SF36 Emotional wellbeing** between groups, $\chi^2(3)=9.44$, p=0.0239 (Table 2.9). Wilcoxon rank sum tests between groups indicated that participants in the *Family and carers* subgroup (median=82.00, IQR=14.00) was significantly higher compared to participants in the *NMOSD (median=62.00, IQR=34.00, p=0.0320), and NMOSD and MOG (median=64.00, IQR=30.00, p=0.0320)* subgroups (Table 2.10).

A Kruskal-Wallis test indicated a statistically significant difference in the SF36 General health between groups, $\chi^2(3)=14.77$, p=0.0020 (Table 2.9). Wilcoxon rank sum tests between groups indicated that participants in the Family and carers subgroup (median=67.50, IQR =22.50) was significantly higher compared to participants in the NMOSD (median=32.50, IQR=32.50, p=0.0045), MOG (median=25.00, IQR=21.25, p=0.0065), and NMOSD and MOG (median=30.00, IQR=25.00, p=0.0026) subgroups (Table 2.10).

A Welch one-way test indicated indicated a statistically significant difference in the SF36 Pain scale between groups F(3, 26.28)=20.55, p<0.0001 (Table 2.11). Post-hoc pairwise t-tests with no assumption of equal variances indicated that the mean score for participants in the Family and carers (mean=86.75, SD=11.43) was significantly higher compared to participants in the NMOSD (mean=43.06, SD=30.07, p=0.0045), MOG (mean=53.13, SD=14.13, p=0073), and NMOSD and MOG (mean=46.15, SD=26.33, p=0.0027) subgroups (Table 2.12).

SF36 Physical functioning scale measures health limitations in physical activities such as walking, bending, climbing stairs, exercise, and housework. On average, participants in the *Family and Carer* subgroup scored higher than participants in the *NMOSD; MOG; and NMOSD and MOG* subgroups. This indicates that physical activities were not limited at all for participants in the *Family and Carer* subgroup, compared to slightly limited for participants in the *NMOSD* subgroup, moderately limited for participants in the *NMOSD and MOG* subgroup.

subgroup, and limited quite a bit for participants in the *MOG* subgroup.

SF36 Role functioning/physical scale measures how physical health interferes with work or other activities. On average, participants in the *Family and Carer* subgroup scored higher than participants in the *NMOSD; MOG; and NMOSD and MOG* subgroups. This indicates that physical health did not at all interfere with work or other activities for participants in subgroup *Family and Carer,* compared to extremely interfered with work or other activities for participants in the *NMOSD, MOG,* and *NMOSD and MOG,* and *NMOSD and MOG,* and *NMOSD and MOG*, subgroups.

SF36 Role functioning/emotional scale measures how emotional problems interfere with work or other activities. On average, participants in the *Family and Carer* subgroup scored higher than participants in the *NMOSD* subgroup. This indicates that emotional problems did not at all interfere with work or other activities for participants in *Family and Carer* subgroup, compared to extremely interfered with work or other activities for participants in the *NMOSD* subgroup.

SF36 Energy/fatigue scale measures the proportion of energy or fatigue experienced. On average, participants in the *Family and Carer* subgroup scored higher than participants in the *NMOSD; MOG; and NMOSD and MOG* subgroups. This indicates that participants in the *Family and Carer* subgroup felt tired some of the time and had energy some of the time, compared participants in the *NMOSD, MOG*, and *NMOSD and MOG* subgroups who felt tired most of the time, had energy a little of the time.

The **SF36 Emotional well-being**, which scale measures how a person feels, for example happy, calm, depressed or anxious. On average, participants in the *Family and Carer* subgroup scored higher than participants in the *NMOSD; and NMOSD and MOG* subgroups. This indicates that participants in the *Family and Carer* subgroup felt happy and calm all of the time, compared participants in the *NMOSD,* and *NMOSD and MOG* subgroups who felt happy and calm most of the time, and anxious and depressed a little of the time.

The **SF36 Social functioning** scale measures limitations on social activities due to physical or emotional problems. On average, participants in the *Family and Carer* subgroup scored higher than participants in the *NMOSD*; and *NMOSD* and *MOG* subgroups. This indicates that social activities were slightly limited for participants in the *Family and Carer* subgroup, compared to social activities were moderately limited for participants in *NMOSD; and NMOSD and MOG* subgroups.

The **SF36 Pain** scale measures how much pain, and how pain interferes with work and other activities. On average, participants in the *Family and Carer* subgroup scored higher than participants in the *NMOSD; MOG; and NMOSD and MOG* subgroups. This indicates that participants in the subgroup *Family and Carer* did not have any pain, compared to participants in the *NMOSD; MOG; and NMOSD and MOG* subgroups, who had moderate pain.

The **SF36 General health** scale measures perception of health. On average, participants in the *Family and Carer* subgroup scored higher than participants in the *NMOSD; MOG; and NMOSD and MOG* subgroups. This indicates that participants in the *Family and Carer* subgroup reported good health, compared to participants in the *NMOSD; MOG; and NMOSD and MOG* subgroups who reported poor general health.

Table 2.7: SF36 by participant type summary statistics and one-way ANOVA test

SF36 scale	Group	Number (n=36)	Percent	Mean	SD	Source of difference	Sum of squares	dF	Mean Square	f	p-value
Energy/Fatigue	NMOSD	18	50.00	28.33	20.72	Between groups	7468.00	3	2489.40	6.23	0.0010*
	MOG	8	22.22	22.50	15.35	Within groups	23178.00	58	399.60		
	NMOSD and MOG	26	72.22	26.54	19.12	Total	30646.00	61			
	Family and carers	10	27.78	56.00	23.78						
Social functioning	NMOSD	18	50.00	47.92	22.79	Between groups	6975.00	3	2325.00	4.67	0.0055*
	MOG	8	22.22	60.94	19.41	Within groups	28884.00	58	498.00		
	NMOSD and MOG	26	72.22	51.92	22.27	Total	35859.00	61			
	Family and carers	10	27.78	78.75	23.61						

*Significant at p<0.005

Table 2.8: SF36 by participant type one-way post hoc Tukey HSD test

SF36 scale	Group	Difference	Lower	Upper	P adjusted
Energy/fatigue	MOG - NMOSD	-5.83	-28.30	16.64	0.9018
	NMOSD and MOG - NMOSD	-1.79	-18.01	14.42	0.9912
	Family and carers - NMOSD	27.67	6.81	48.52	0.0047*
	NMOSD - MOG	4.04	-17.34	25.42	0.9588
	Family and carers - MOG	33.50	8.42	58.58	0.0044*
	Family and carers - NMOSD and MOG	29.46	9.79	49.14	0.0012*
Social functioning	MOG - NMOSD	13.02	-12.06	38.10	0.5211
Social functioning	NMOSD and MOG - NMOSD	4.01	-14.09	22.11	0.9361
	Family and carers - NMOSD	30.83	7.55	54.11	0.0048*
	NMOSD - MOG	-9.01	-32.88	14.85	0.7505
	Family and carers - MOG	17.81	-10.19	45.81	0.3420
	Family and carers - NMOSD and MOG	26.83	4.86	48.79	0.0107*

*Significant at p<0.005

Table 2.9: SF36 by participant type summary statistics and Kruskal Wallis test

SF36 scale	Group	Number (n=36)	Percent	Median	IQR	C ²	dF	p-value
Physical functioning	NMOSD	18	50.00	62.50	53.75	14.80	3	0.0020*
	MOG	8	22.22	35.00	56.25			
	NMOSD and MOG	26	72.22	57.50	57.50			
	Family and carers	10	27.78	92.50	12.50			
Role functioning/physical	NMOSD	18	50.00	0.00	87.50	13.70	3	0.0033*
	MOG	8	22.22	0.00	12.50			
	NMOSD and MOG	26	72.22	0.00	50.00			
	Family and carers	10	27.78	100.00	0.00			
Role functioning/emotional	NMOSD	18	50.00	0.00	66.67	10.74	3	0.0132*
	MOG	8	22.22	100.00	41.67			
	NMOSD and MOG	26	72.22	33.33	100.00			
	Family and carers	10	27.78	100.00	25.00			
Emotional well-being	NMOSD	18	50.00	62.00	34.00	9.44	3	0.0239*
	MOG	8	22.22	70.00	16.00			
	NMOSD and MOG	26	72.22	64.00	30.00			
	Family and carers	10	27.78	82.00	14.00			
General health	NMOSD	18	50.00	32.50	32.50	14.77	3	0.0020*
	MOG	8	22.22	25.00	21.25			
	NMOSD and MOG	26	72.22	30.00	25.00			
	Family and carers	10	27.78	67.50	22.50			
Health change	NMOSD	18	50.00	37.50	43.75	3.76	3	0.2881
	MOG	8	22.22	25.00	31.25			
	NMOSD and MOG	26	72.22	25.00	25.00			
	Family and carers	10	27.78	50.00	0.00			

*Significant at p<0.005

Table 2.10: SF36 by participant type one-way post hoc Wilcoxon rank sum test p-values

SF36 scale	Group	NMOSD	MOG	NMOSD and MOG
Physical functioning	MOG	NMOSD MOG N 0.8481 - 0.8481 - 0.8481 0.8481 0.8481 0.8481 0.0045* 0.0073* 0.0073* 0.8265 - 0.8265 0.8265 0.8265 0.0098* 0.0098* 0.0600 - - 0.3910 0.1550 0.0370* 0.7100 - 0.3610 - 0.6150 0.4670 0.0320* 0.1180 0.9326 - - 0.9326 -	-	
SF36 scale Physical functioning Role functioning/physical Role functioning/emotional Emotional well-being General health	NMOSD and MOG	0.8481	0.8481	-
	Family and carers	0.0045*	0.0073*	0.0027*
Role functioning/physical	MOG	0.8265	-	-
	NMOSD and MOG	0.8265	0.8265	-
	Family and carers	0.0098*	0.0098*	0.0065*
Role functioning/emotional	MOG	0.0600	-	-
	NMOSD and MOG	0.3910	0.1550	-
	Family and carers	0.0370*	0.7100	0.0600
Emotional well-being	MOG	0.3610	-	-
	NMOSD and MOG	0.6150	0.4670	-
	Family and carers	0.0320*	0.1180	0.0320*
General health	MOG	0.9426	-	-
	NMOSD and MOG	0.9426	0.9426	-
	Family and carers	0.0045*	0.0065*	0.0026*

*Significant at p<0.005

Table 2.11: SF36 by participant type summary statistics and Welch one-way test

SF36 scale	Group	Number (n=36)	Percent	Mean	SD	F	dF1	dF2	P-value
Pain	NMOSD	18	50.00	43.06	30.07	20.55	3	26.28	< 0.0001*
	MOG	8	22.22	53.13	14.13				
	NMOSD and MOG	26	72.22	46.15	26.33				
	Family and carers	10	27.78	86.75	11.43				

*Significant at p<0.005

Table 2.12: SF36 by participant type one-way post hoc pairwise t-tests p-values

SF36 scale	Group	NMOSD	MOG	NMOSD and MOG
Pain	MOG	0.8481	-	-
	NMOSD and MOG	0.8481	0.8481	-
	Family and carers	0.0045*	0.0073*	0.0027*
	·	2.2010		

*Significant at p<0.005



Figure 2.4: Boxplot of SF36 Physical functioning by participant type



Figure 2.6: Boxplot of SF36 Role functioning/emotional by participant type

Role functional/physical



Figure 2.5: Boxplot of SF36 Role functioning/physical by participant type



Figure 2.7: Boxplot of SF36 Energy/fatigue by participant type



Figure 2.8: Boxplot of SF36 Emotional well-being by participant type



Figure 2.10: Boxplot of SF36 Pain by participant type





Comparisons of SF36 scales by Relapse

Comparisons were made by NMOSD **relapses**, those less than two relapses were included in the *Fewer relapses* subgroup (n=9, 50.00%), and those that had three or more relapses, in the *More relapses* subgroup (n=9, 50.00%). Only participants with NMOSD were included in this comparison.

Boxplots of each SF36 scale by **relapse** are displayed in Figures 2.13 to 2.21, summary statistics are



Figure 2.9: Boxplot of SF36 Social functioning by participant type



Figure 2.11: Boxplot of SF36 General health by participant type

displayed in Tables 2.13 to 2.14. A two-sample t-test was used when assumptions for normality and variance were met (Table 2.13), or when assumptions for normality and variance were not met, a Wilcoxon rank sum test with continuity correction was used (Table 2.14).

No significant differences were observed between participants in the *Fewer relapses* subgroup compared to those in the *More relapses* subgroup for any of the SF36 scales.

Table 2.13: SF36 by relapse summary statistics and two sample t-test

SF36 scale	Group	Number (n=18)	Percent	Mean	SD	т	dF	p-value
Physical functioning	Fewer relapses	9	50.00	52.22	31.24	-0.18	16	0.8603
	More relapses	9	50.00	55.00	34.55			
Energy/Fatigue	Fewer relapses	9	50.00	35.00	18.71	1.40	16	0.1796
	More relapses	9	50.00	21.67	21.51			
Emotional well-being	Fewer relapses	9	50.00	68.00	23.49	1.92	16	0.0731
	More relapses	9	50.00	47.11	22.70			
Social functioning	Fewer relapses	9	50.00	52.78	18.52	0.90	16	0.3815
	More relapses	9	50.00	43.06	26.60			
Pain	Fewer relapses	9	50.00	42.78	32.12	-0.04	16	0.9701
	More relapses	9	50.00	43.33	29.82			
General health	Fewer relapses	9	50.00	38.33	24.11	1.00	16	0.3339
	More relapses	9	50.00	27.22	23.20			
Health change	Fewer relapses	9	50.00	38.89	28.26	-0.49	16	0.6297
	More relapses	9	50.00	47.22	42.29			

Table 2.14: SF36 by relapse summary statistics and Wilcoxon rank sum tests with continuity correction

SF36 scale	Group	Number (n=18)	Percent	Median	IQR	W	p-value
Role functioning/physical	Fewer relapses	9	50.00	0.00	100.00	48.5	0.4233
	More relapses	9	50.00	0.00	0.00		
Role functioning/emotional	Fewer relapses	9	50.00	0.00	100.00	48	0.4788
	More relapses	9	50.00	0.00	33.33		

SF36 score



Role functioning/physical



Figure 2.13: Boxplot of SF36 Physical functioning by relapse





Figure 2.15: Boxplot of SF36 functioning/emotional by relapse

Role Figure 2.16: Boxplot of SF36 Energy/fatigue by relapse



Figure 2.17: Boxplot of SF36 Emotional well-being by relapse



Figure 2.19: Boxplot of SF36 Pain by relapse



Figure 2.21: Boxplot of SF36 Health change by relapse

Comparisons of SF36 scales by fear of progression

The Fear of Progression questionnaire measures the level of anxiety people experience in relation to their conditions. The Fear of Progression questionnaire comprises a total score, between 12 and 60, with a higher score denoting increased anxiety. Participants that scored over 41 in the fear of progression questionnaire were included in the High to very high fear subgroup (n=10, 55.56%), and those that scored less than 41 were included in the Low to moderate fear subgroup (n=8, 44.44%). Only Volume 3 (2020), Issue 4: PEEK Study in NMOSD



Figure 2.18: Boxplot of SF36 Social functioning by relapse



Figure 2.20: Boxplot of SF36 General health by relapse

participants with NMOSD were included in this comparison.

Boxplots of each SF36 scale by fear of progression are displayed in Figures 2.22 to 2.30, summary statistics are displayed in Tables 2.15 to 2.16. A twosample t-test was used when assumptions for normality and variance were met (Table 2.15), or when assumptions for normality and variance were not met, a Wilcoxon rank sum test with continuity correction was used (Table 2.16).

Wilcoxon rank sum tests with continuity correction indicated that the median score for the **SF36 Role functioning/emotional** [W= 60.00, p=0.0471] was significantly higher for participants in the *Low to moderate fear* subgroup (median=66.67, IQR=100.00) compared to participants in the *High to very high fear* subgroup (median=0.00, IQR =0.00).

Wilcoxon rank sum tests with continuity correction indicated that the median score for the **SF36 Health change** [W= 64.00, p=0.0325] was significantly higher for participants in the *Low to moderate fear* subgroup (median=62.50, IQR=37.50) compared to participants in the *High to very high fear* subgroup (median=25.00, IQR =43.75).

The **SF36 Role functioning/emotional** scale measures how emotional problems interfere with work or other activities. On average, participants in

the *Low to moderate fear* subgroup scored higher than participants in the *High to very high fear* subgroup. This indicates that emotional problems slightly interfered with work or other activities for participants in the *Low to moderate fear* subgroup, compared to extremely interfered with work or other activities for participants in the *High to very high fear* subgroup.

The **SF36 Health change** scale measures health compared to a year ago. On average, participants in the *Low to moderate fear* subgroup scored higher than participants in the *High to very high fear* subgroup. This indicates that participants in subgroup *Low to moderate fear* have health that is somewhat better now than one year ago, compared to participants in the *High to very high fear* subgroup who reported somewhat worse health.

Table 2.15: SF36 by fear of progression summa	ry statistics and two sample t-test
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SF36 scale	Group	Number (n=18)	Percent	Mean	SD	Т	dF	p-value
Dhusiaal functioning	Low to moderate fear	8	30.77	63.13	26.31	1.14	16	0.2716
riysical functioning	High to very high fear	10	38.46	46.00	35.34			
Frank /Fahlana	Low to moderate fear	8	30.77	36.25	20.13	1.50	16	0.1525
Ellergy/Fatigue	High to very high fear	10	38.46	22.00	19.89			
Emotional well being	Low to moderate fear	8	30.77	67.00	22.30	1.49	16	0.1548
Emotional weil-being	High to very high fear	10	38.46	50.00	25.25			
Social functioning	Low to moderate fear	8	30.77	54.69	22.10	1.14	16	0.2722
	High to very high fear	10	38.46	42.50	22.97			

*Significant at p<0.005

Table 2.16: SF36 by fear of progression summary statistics and Wilcoxon rank sum tests with continuity correction

SF36 scale	Group	Number (n=18)	Percent	Median	IQR	W	p-value
Role functioning/physical	Low to moderate fear	8	30.77	25.00	100.00	51.00	0.2594
	High to very high fear	10	38.46	0.00	0.00		
Role functioning/emotional	Low to moderate fear	8	30.77	66.67	100.00	60.00	0.0471*
	High to very high fear	10	38.46	0.00	0.00		
Pala	Low to moderate fear	8	30.77	57.50	22.50	60.00	0.0814
Falli	High to very high fear	10	38.46	22.50	31.25		
General health	Low to moderate fear	8	30.77	40.00	17.50	58.00	0.1182
General health	High to very high fear	10	38.46	20.00	32.50		
Health change	Low to moderate fear	8	30.77	62.50	37.50	64.00	0.0325*
	High to very high fear	10	38.46	25.00	43.75		

SF36 score

*Significant at p<0.005





Figure 2.22: Boxplot of SF36 Physical functioning by fear of progression

Figure 2.23: Boxplot of SF36 Role functioning/physical by fear of progression







Figure 2.26: Boxplot of SF36 Emotional well-being by fear of progression







Figure 2.30: Boxplot of SF36 Health change by fear of progression

Energy/fatigue









Figure 2.29: Boxplot of SF36 General health by fear of progression

Comparisons of SF36 scales by physical function

The SF36 Physical functioning scale measures health limitations in physical activities such as walking, bending, climbing stairs, exercise, and housework. Comparisons were made by **physical function**, participants that scored in the lowest three quintiles of the SF36 Physical functioning scale were included in the *Moderate to very poor physical function* subgroup (n=9, 50.00%), and participants that scored in the highest two quintiles were included in the *Good to very good physical function* subgroup (n=9, 50.00%). Only participants with NMOSD were included in this comparison.

Boxplots of each SF36 scale by **physical function** are displayed in Figures 2.31 to 2.38, summary statistics are displayed in Tables 2.17 to 2.18. A two-sample t-test was used when assumptions for normality and variance were met (Table 2.17), or when assumptions for normality and variance were not met, a Wilcoxon rank sum test with continuity correction was used (Table 2.18).

A two sample t-test indicated that the mean score for the **SF36 Energy/fatigue** [t(16) = -2.84 p=0.0118] was significantly higher for participants in the *Good to very good physical function* subgroup (mean =40.00, SD =17.68) compared to participants in the *Moderate to very poor physical function* subgroup (mean = 16.67, SD = 17.14).

A two sample t-test indicated that the mean score for the **SF36 Social functioning** [t(16) = -2.13p=0.0489]was significantly higher for participants in the *Good to very good physical function* subgroup (mean =58.33, SD =17.68) compared to participants in the *Moderate to very poor physical function* subgroup (mean = 37.50, SD = 23.39)

A two sample t-test indicated that the mean score for the **SF36 Pain** [t(16) = -4.55 p=0.0003] was significantly higher for participants in the *Good to very good physical function* subgroup (mean =65.00, SD =23.28) compared to participants in the *Moderate to very poor physical function* subgroup (mean = 21.11, SD = 17.19).

A two sample t-test indicated that the mean score for the **SF36 Health change** [W= 4.50, p=0.0013] was significantly higher for participants in the *Good to very good physical function* subgroup (mean =65.00, SD =23.28) compared to participants in the Volume 3 (2020), Issue 4: PEEK Study in NMOSD Moderate to very poor physical function subgroup (mean = 21.11, SD = 17.19).

Wilcoxon rank sum tests with continuity correction indicated that the median score for the **SF36 Health change** [W= 4.50, p=0.0013] was significantly higher for participants in the *Good to very good physical function* subgroup (median =75.00, IQR =50.00) compared to participants in the *Moderate to very poor physical function* subgroup (median = 25.00, IQR = 25.00)

SF36 Energy/fatigue scale measures the proportion of energy or fatigue experienced. On average, participants in the *Good to very good physical function* subgroup scored higher than participants in the *Moderate to very poor physical function* subgroup. This indicates that participants in the *Good to very good physical function* subgroup tired most of the time, had energy a little of the time, compared participants in the *Moderate to very poor physical function* subgroup who felt tired all of the time.

The **SF36** Social functioning scale measures limitations on social activities due to physical or emotional problems On average, participants in the *Good to very good physical function* subgroup scored higher than participants in the *Moderate to very poor physical function* subgroup. This indicates that social activities were moderately limited for participants in the *Good to very good physical function* subgroup, compared to social activities were quite limited for participants in the *Moderate to very poor physical function* subgroup.

The **SF36 Pain** scale measures how much pain, and how pain interferes with work and other activities. On average, participants in the *Good to very good physical function* subgroup scored higher than participants in the *Moderate to very poor physical function* subgroup. This indicates that participants in the *Good to very good physical function* subgroup had a little pain, compared to participants in the *Moderate to very poor physical function* subgroup, who had a lot of pain.

The **SF36 Health change** scale measures health compared to a year ago. On average, participants in the *Good to very good physical function* subgroup scored higher than participants in the *Moderate to very poor physical function* subgroup. This indicates

that participants in Good to very good physical function subgroup have health that is somewhat better now than one year ago, compared to

participants in the *Moderate to very poor physical* function who reported somewhat worse health.

Table 2.17: SF36 by physical	function summary statistics	and two sample t-test
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SF36 scale	Group	Number (n=18)	Percent	Mean	SD	т	dF	p-value
Energy/Fatigue	Moderate to very poor physical function	9	50.00	16.67	17.14	-2.84	16	0.0118*
	Good to very good physical function	9	50.00	40.00	17.68			
Emotional well-being	Moderate to very poor physical function	9	50.00	46.67	28.28	-2.02	16	0.0604
	Good to very good physical function	9	50.00	68.44	15.68			
Social functioning	Moderate to very poor physical function	9	50.00	37.50	23.39	-2.13	16	0.0489*
	Good to very good physical function	9	50.00	58.33	17.68			
Pain	Moderate to very poor physical function	9	50.00	21.11	17.19	-4.55	16	0.0003*
	Good to very good physical function	9	50.00	65.00	23.28			
General health	Moderate to very poor physical function	9	50.00	22.22	16.79	-2.07	16	0.0552
	Good to very good physical function	9	50.00	43.33	25.62			

*Significant at p<0.005

Table 2.18: SF36 by physical function summary statistics and Wilcoxon rank sum tests with continuity correction

SF36 scale	Group	Number (n=18)	Percent	Median	IQR	W	p-value
Role functioning/physical	Moderate to very poor physical function	9	50.00	0.00	0.00	23.00	0.0696
	Good to very good physical function	9	50.00	50.00	100.00		
Role functioning/emotional	Moderate to very poor physical function	9	50.00	0.00	33.33	33.00	0.4788
	Good to very good physical function	9	50.00	0.00	100.00		
Health change	Moderate to very poor physical function	9	50.00	25.00	25.00	4.50	0.0013*
	Good to very good physical function	9	50.00	75.00	50.00		

*Significant at p<0.005





Role

Figure 2.31: Boxplot of SF36 Role functioning/physical by physical function



Figure 2.33: Boxplot of SF36 Energy/fatigue by physical function

of Figure 2.32: SF36 Boxplot functioning/emotional by physical function









Figure 2.35: Boxplot of SF36 Social functioning by physical function



Figure 2.37: Boxplot of SF36 General health by physical function

Comparisons of SF36 scales by education

Comparisons were made by **education** status, between those with trade or high school qualifications, *trade or high school* (n=10, 55.56%), and those with a university qualification, *University* (n= 8, 44.44%). Only participants with NMOSD were included in this comparison.

Boxplots of each SF36 scale by **education** are displayed in Figures 2.39 to 2.47, summary statistics are displayed in Tables 2.19 to 2.20). A two-sample t-test was used when assumptions for normality and variance were met (Table 2.19), or when assumptions for normality and variance were not met, a Wilcoxon rank sum test with continuity correction was used (Table 2.20).

A two sample t-test indicated that the mean score for the **SF36 Energy/fatigue** [t(16) = -3.24 p=0.0051] was significantly higher for participants in the *University* subgroup (mean = 42.50, SD = 18.71) compared to participants in the *Trade or high school* subgroup (mean = 17.00, SD = 14.76).





Figure 2.38: Boxplot of SF36 Health change by physical function

Wilcoxon rank sum tests with continuity correction indicated that the median score for the **Role functioning/physical** [W=19.50, p = 0.0317] was significantly higher for participants in the *University* subgroup (Median = 75.00, IQR = 100.00) compared to participants in the *Trade or high school* subgroup (Median = 0.00, SD=0.00).

Wilcoxon rank sum tests with continuity correction indicated that the median score for the **Role functioning/emotional** [W=18.50, p = 0.0325] was significantly higher for participants in the *University* subgroup (Median = 83.33, IQR = 100.00) compared to participants in the *Trade or high school* subgroup (Median = 0.00, SD = 0.00).

Wilcoxon rank sum tests with continuity correction indicated that the median score for the **General health** [W=14.00, p = 0.0228] was significantly higher for participants in the *University* subgroup (Median = 45.00, IQR = 23.75) compared to participants in the *Trade or high school* subgroup (Median = 22.50, SD = 27.50).

SF36 Role functioning/physical scale measures how physical health interferes with work or other activities. On average, participants in the *University* subgroup scored higher than participants in the *Trade or high school* subgroup. This indicates that physical health interfered a little with work or other activities for participants in *University* subgroup, compared to extremely interfered with work or other activities for participants in the *Trade or high school* subgroup.

SF36 Role functioning/emotional scale measures how emotional problems interfere with work or other activities On average, participants in the *University* subgroup scored higher than participants in the *Trade or high school* subgroup. This indicates that emotional problems did not at all interfere with work or other activities for participants in the *University* subgroup, compared to extremely interfered with work or other activities for participants in the *Trade or high school* subgroup. **SF36 Energy/fatigue** scale measures the proportion of energy or fatigue experienced. On average, participants in the *University* subgroup scored higher than participants in the *Trade or high school* subgroup. This indicates that participants in the *University* subgroup felt tired some of the time and had energy some of the time, compared to participants in *Trade or high school* subgroup who felt tired all of the time.

The **SF36 Health change** scale measures health compared to a year ago. On average, participants in the *University* subgroup scored higher than participants in the *Trade or high school* subgroup. This indicates that participants in *University* subgroup have health that is about the same now as one year ago, compared to participants in the *Trade or high school* subgroup who reported somewhat worse health.

Table 2.19: SF36 by education summary statistics and two sample t-test

SF36 scale	Group	Number (n=18)	Percent	Mean	SD	т	dF	p-value
Physical functioning	Trade or high school	10	55.56	41.00	33.48	-2.04	16	0.0587
	University	8	44.44	69.38	23.06			
Energy/Fatigue	Trade or high school	10	55.56	17.00	14.76	-3.24	16	0.0051*
	University	8	44.44	42.50	18.71			
Emotional well-being	Trade or high school	10	55.56	48.00	22.55	-1.97	16	0.0661
	University	8	44.44	69.50	23.51			
Social functioning	Trade or high school	10	55.56	40.00	20.24	-1.74	16	0.1003
	University	8	44.44	57.81	23.09			
Pain	Trade or high school	10	55.56	33.50	30.17	-1.57	16	0.1357
	University	8	44.44	55.00	27.06			
Health change	Trade or high school	10	55.56	32.50	33.44	-1.47	16	0.1603
	University	8	44.44	56.25	34.72			

*Significant at p<0.005

Table 2.20: SF36 by education summary statistics and Wilcoxon rank sum tests with continuity correction

SF36 scale	Group	Number (n=18)	Percent	Median	IQR	w	p-value
Role functioning/physical	Trade or high school	10	55.56	0.00	0.00	19.50	0.0317*
	University	8	44.44	75.00	100.00		
Role functioning/emotional	Trade or high school	10	55.56	0.00	0.00	18.50	0.0325*
	University	8	44.44	83.33	100.00		
General health	Trade or high school	10	55.56	22.50	27.50	14.00	0.0228*
	University	8	44.44	45.00	23.75		

*Significant at p<0.005



Figure 2.39: Boxplot of SF36 Physical functioning by education





Figure 2.40: Boxplot of SF36 Role functioning/physical by education







Figure 2.43: Boxplot of SF36 Emotional well-being by education









Energy/fatigue

Figure 2.42: Boxplot of SF36 Energy/fatigue by education



Figure 2.44: Boxplot of SF36 Social functioning by education



Figure 2.46: Boxplot of SF36 General health by education

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Figure 2.47: Boxplot of SF36 Health change by education

Comparisons of SF36 scales by socioeconomic status

Comparisons were made by **socioeconomic status**, using the Socio-economic Indexes for Areas (SEIFA) (www.abs.gov.au), SEIFA scores range from 1 to 10, a higher score denotes a higher level of advantage. Participants with a mid to low SEIFA score of 1-6, *Mid to low status* (n=6, 33.33%) compared to those with a higher SEIFA score of 7-10, *Higher status* (n=12, 66.67%) . Only participants with NMOSD were included in this comparison.

Boxplots of each SF36 scale by **socioeconomic status** are displayed in Figures 2.48 to 2.56, summary statistics are displayed in Tables 2.21 to 2.22. A two-sample t-test was used when assumptions for normality and variance were met (Table 2.21), or when assumptions for normality and variance were not met, a Wilcoxon rank sum test with continuity correction was used (Table 2.22).

No significant differences were observed between participants in the *Mid to low status* subgroup compared to those in the *Higher status* subgroup for any of the SF36 scales.

Table 2.21: SF36 by socioeconomic status summary statistics and two sample t-test

SF36 scale	Group	Number (n=18)	Percent	Mean	SD	т	dF	p-value
Physical functioning	Aged 18 to 44	8	44.44	55.63	36.59	0.23	16	0.8193
	Aged 45 or older	10	55.56	52.00	29.74			
Energy/Fatigue	Aged 18 to 44	8	44.44	30.00	21.38	0.30	16	0.7704
	Aged 45 or older	10	55.56	27.00	21.24			
Emotional well-being	Aged 18 to 44	8	44.44	49.50	24.74	-1.25	16	0.2292
	Aged 45 or older	10	55.56	64.00	24.22			
Social functioning	Aged 18 to 44	8	44.44	40.63	27.35	-1.23	16	0.2355
	Aged 45 or older	10	55.56	53.75	17.73			
Pain	Aged 18 to 44	8	44.44	47.50	33.27	0.55	16	0.5904
	Aged 45 or older	10	55.56	39.50	28.55			
General health	Aged 18 to 44	8	44.44	30.00	24.05	-0.43	16	0.6695
	Aged 45 or older	10	55.56	35.00	24.38			
Health change	Aged 18 to 44	8	44.44	43.75	43.81	0.07	16	0.9429
	Aged 45 or older	10	55.56	42.50	28.99			

Table 2.22: SF36 by socioeconomic status summary statistics and Wilcoxon rank sum tests with continuity correction





Role functioning/physical



Figure 2.48: Boxplot of SF36 Physical functioning by socioeconomic status









Figure 2.52: Boxplot of SF36 Emotional well-being by socioeconomic status







Figure 2.56: Boxplot of SF36 Health change by socioeconomic status



Figure 2.51: Boxplot of SF36 Energy/fatigue by socioeconomic status







Figure 2.55: Boxplot of SF36 General health by socioeconomic status

Comparisons of SF36 scales by age

Participants were grouped according to **age**, with comparisons made between participants *Aged 18 to* 44 (n=7, 38.89%), , and *Aged 45 or older* (n=11, 61.11%). Only participants with NMOSD were included in this comparison.

Boxplots of each SF36 scale by **age** are displayed in Figures 2.57 to 2.65, summary statistics are displayed in Tables 2.23 to 2.24. A two-sample t-test

was used when assumptions for normality and variance were met (Table 2.23), or when assumptions for normality and variance were not met, a Wilcoxon rank sum test with continuity correction was used (Table 2.24).

No significant differences were observed between participants in the *Aged 18 to 44* subgroup compared to those in the *Aged 45 or older* subgroup for any of the SF36 scales.

Table 2.23: SF36 by age summary statistics and two sample t-test

SF36 scale	Group	Number (n=18)	Percent	Mean	SD	т	dF	p-value
Physical functioning	Aged 18 to 44	7	38.89	60.71	36.34	0.74	16	0.4691
	Aged 45 or older	11	61.11	49.09	29.82			
Energy/Fatigue	Aged 18 to 44	7	38.89	32.14	22.15	0.61	16	0.5500
	Aged 45 or older	11	61.11	25.91	20.47			
Emotional well-being	Aged 18 to 44	7	38.89	47.43	25.97	-1.42	16	0.1749
	Aged 45 or older	11	61.11	64.00	22.98			
Social functioning	Aged 18 to 44	7	38.89	42.86	28.74	-0.74	16	0.4692
	Aged 45 or older	11	61.11	51.14	18.92			
Pain	Aged 18 to 44	7	38.89	49.64	35.34	0.73	16	0.4752
	Aged 45 or older	11	61.11	38.86	27.17			
General health	Aged 18 to 44	7	38.89	28.57	25.61	-0.59	16	0.5633
	Aged 45 or older	11	61.11	35.45	23.18			
Health change	Aged 18 to 44	7	38.89	50.00	43.30	0.66	16	0.5203
	Aged 45 or older	11	61.11	38.64	30.34			

Table 2.24: SF36 by age summary statistics and Wilcoxon rank sum tests with continuity correction

SF36 scale	Group	Number (n=18)	Percent	Median	IQR	w	p-value
Role functioning/physical	Aged 18 to 44	7	38.89	0.00	100.00	46.00	0.4434
	Aged 45 or older	11	61.11	0.00	25.00		
Role functioning/emotional	Aged 18 to 44	7	38.89	0.00	50.00	35.00	0.7555
	Aged 45 or older	11	61.11	0.00	66.67		

*Significant at p<0.005





Figure 2.58: Boxplot of SF36 Role functioning/physical





functioning/emotional by age



Figure 2.61: Boxplot of SF36 Emotional well-being by age







Figure 2.65: Boxplot of SF36 Health change by age

Gender

There were 16 females (n=16, 88.89%) with NMOSD, however, there were too few males (n=2, 11.11%)

General health

Figure 2.64: Boxplot of SF36 General health by age

for comparisons to be made. Data by **gender** is displayed for NMOSD participants in Table 2.25, but no analysis conducted.

Table 2.17: SF36 b	y gender summary	v statistics
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SF36 scale	Group	Number (n=18)	Percent	Mean	SD	Median	IQR
Physical functioning	Female	16	88.89	55.94	32.00	65.00	50.00
	Male	2	11.11	35.00	35.36	35.00	25.00
Role functioning/physical	Female	16	88.89	34.38	47.32	0.00	100.00
	Male	2	11.11	0.00	0.00	0.00	0.00
Role functioning/emotional	Female	16	88.89	31.25	44.67	0.00	75.00
	Male	2	11.11	33.33	47.14	33.33	33.33
Energy/Fatigue	Female	16	88.89	31.25	20.12	32.50	27.50
	Male	2	11.11	5.00	0.00	5.00	0.00
Emotional well-being	Female	16	88.89	60.00	25.34	64.00	26.00
	Male	2	11.11	38.00	2.83	38.00	2.00
Social functioning Female Male	Female	16	88.89	48.44	23.22	50.00	37.50
	Male	2	11.11	43.75	26.52	43.75	18.75
Pain Female Male	Female	16	88.89	46.25	30.39	45.00	45.00
	Male	2	11.11	17.50	7.07	17.50	5.00
General health Ferr	Female	16	88.89	34.69	24.05	35.00	31.25
	Male	2	11.11	17.50	17.68	17.50	12.50
Health change	Female	16	88.89	46.88	35.21	50.00	50.00
	Male	2	11.11	12.50	17.68	12.50	12.50

Location

The **location** of participants was evaluated by postcode using the Australian Statistical Geography Maps (ASGS) Remoteness areas accessed from the Australian Bureau of Statistics. There were 15 participants with NMOSD (83.33%) that lived in *Metropolitan* areas, however, too few participants

with NMOSD lived in *Regional or remote* areas (16.67%) for comparisons to be made. Data by **location** is displayed for NMOSD participants throughout the study, but no analysis conducted. Data by **location** is displayed for NMOSD participants in Table 2.26, but no analysis conducted.

Table 2.22: SF36 by location summary statistics

SF36 scale	Group	Number (n=18)	Percent	Mean	SD	Median	IQR
Physical functioning	Regional or remote	3	16.67	55.94	32.00	65.00	50.00
	Metropolitan	15	83.33	35.00	35.36	35.00	25.00
Role functioning/physical	Regional or remote	16	88.89	34.38	47.32	0.00	100.00
	Metropolitan	2	11.11	0.00	0.00	0.00	0.00
Role functioning/emotional	Regional or remote	16	88.89	31.25	44.67	0.00	75.00
	Metropolitan	2	11.11	33.33	47.14	33.33	33.33
Energy/Fatigue	Regional or remote	16	88.89	31.25	20.12	32.50	27.50
	Metropolitan	2	11.11	5.00	0.00	5.00	0.00
Emotional well-being	Regional or remote	16	88.89	60.00	25.34	64.00	26.00
	Metropolitan	2	11.11	38.00	2.83	38.00	2.00
Social functioning	Regional or remote	16	88.89	48.44	23.22	50.00	37.50
	Metropolitan	2	11.11	43.75	26.52	43.75	18.75
Pain	Regional or remote	16	88.89	46.25	30.39	45.00	45.00
	Metropolitan	2	11.11	17.50	7.07	17.50	5.00
General health	Regional or remote	16	88.89	34.69	24.05	35.00	31.25
	Metropolitan	2	11.11	17.50	17.68	17.50	12.50
Health change	Regional or remote	16	88.89	46.88	35.21	50.00	50.00
	Metropolitan	2	11.11	12.50	17.68	12.50	12.50