Nahrávání dat a vytvoření proměnných

```
T = readtable('data.csv', 'HeaderLines', 2);
```

```
Warning: Column headers from the file were modified to make them valid MATLAB identifiers
before creating variable names for the table. The original column headers are saved in the
VariableDescriptions property.
Set 'VariableNamingRule' to 'preserve' to use the original column headers as table variable names.
```

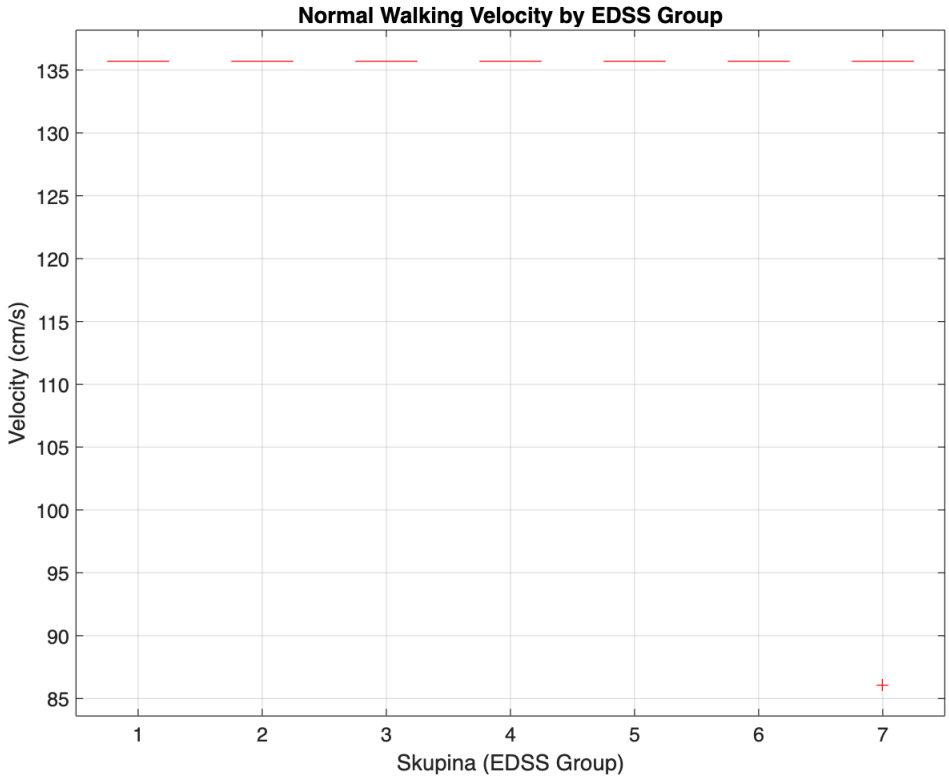
```
group1 = T(T.Skupina == 1, :);
group2 = T(T.Skupina == 2, :);
group3 = T(T.Skupina == 3, :);
group4 = T(T.Skupina == 4, :);
group5 = T(T.Skupina == 5, :);
group6 = T(T.Skupina == 6, :);
group7 = T(T.Skupina == 7, :);

colNames = T.Properties.VariableNames
```

```
colNames = 1×33 cell
'Inicialy'  'EDSS'      'Skupina'   'vek'       'delkaDolni''NormalniChuze''Rych ···
```

```
% Extract velocity data from cell arrays
group1_normal_velocity = group1.NormalniChuze;
group2_normal_velocity = group2.NormalniChuze;
group3_normal_velocity = group3.NormalniChuze;
group4_normal_velocity = group4.NormalniChuze;
group5_normal_velocity = group5.NormalniChuze;
group6_normal_velocity = group6.NormalniChuze;
group7_normal_velocity = group7.NormalniChuze;

% Create the boxplot
all_normal_velocities = [group1_normal_velocity; group2_normal_velocity;
group3_normal_velocity; ...
                  group4_normal_velocity; group5_normal_velocity;
group6_normal_velocity; ...
                  group7_normal_velocity];

% Create corresponding group labels
normal_group_labels = [ones(length(group1_normal_velocity), 1); ...
                ones(length(group2_normal_velocity), 1)*2; ...
                ones(length(group3_normal_velocity), 1)*3; ...
                ones(length(group4_normal_velocity), 1)*4; ...
                ones(length(group5_normal_velocity), 1)*5; ...
                ones(length(group6_normal_velocity), 1)*6; ...
                ones(length(group7_normal_velocity), 1)*7];
```

Vykreslení boxplots pro rychlost normální chůze přes 7 skupin

```
figure();
boxplot(all_normal_velocities, normal_group_labels, 'Labels',
{'1','2','3','4','5','6','7'});
title('Normal Walking Velocity by EDSS Group');
xlabel('Skupina (EDSS Group)');
ylabel('Velocity (cm/s)');
grid on;
```

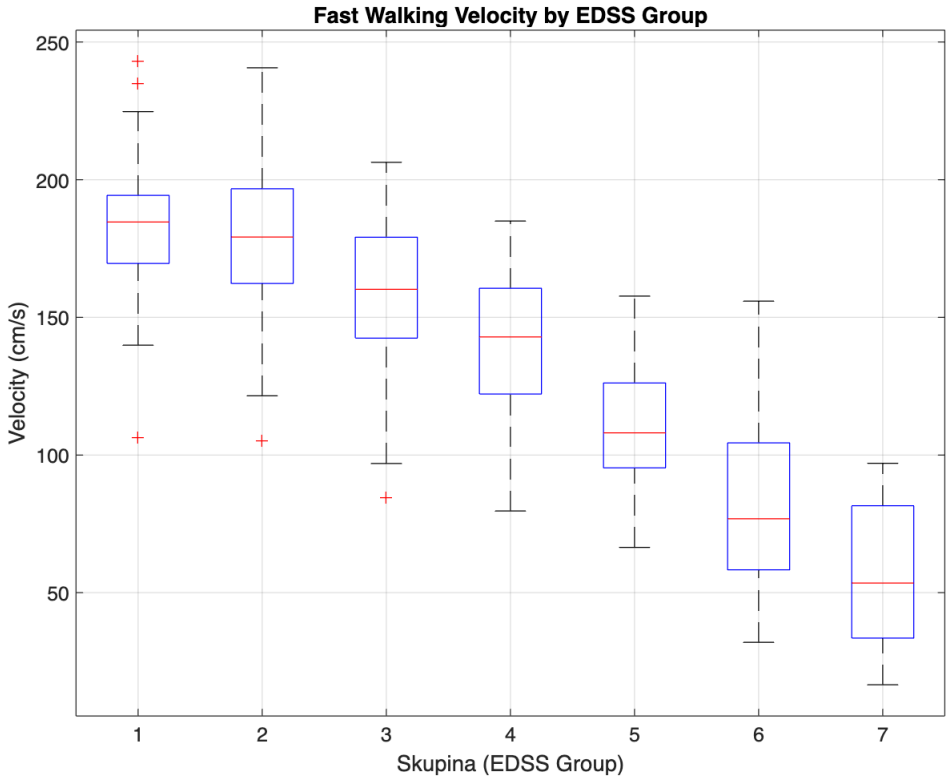



```
%graf vypadá divně, ale je to správně všichni měli 135.7 rychlost
```

Vykreslení rychlosti rychlé chůze přes 7 skupin

```
group1_fast_velocity = group1.RychlaChuze;
group2_fast_velocity = group2.RychlaChuze;
group3_fast_velocity = group3.RychlaChuze;
group4_fast_velocity = group4.RychlaChuze;
group5_fast_velocity = group5.RychlaChuze;
group6_fast_velocity = group6.RychlaChuze;
group7_fast_velocity = group7.RychlaChuze;

all_fast_velocities = [group1_fast_velocity; group2_fast_velocity;
group3_fast_velocity; ...
                  group4_fast_velocity; group5_fast_velocity;
group6_fast_velocity; ...
                  group7_fast_velocity];
```

```
% Create corresponding group labels
fast_group_labels = [ones(length(group1_fast_velocity), 1); ...
                ones(length(group2_fast_velocity), 1)*2; ...
                ones(length(group3_fast_velocity), 1)*3; ...
                ones(length(group4_fast_velocity), 1)*4; ...
                ones(length(group5_fast_velocity), 1)*5; ...
                ones(length(group6_fast_velocity), 1)*6; ...
                ones(length(group7_fast_velocity), 1)*7];

figure();
boxplot(all_fast_velocities, fast_group_labels, 'Labels',
{'1','2','3','4','5','6','7'});
title('Fast Walking Velocity by EDSS Group');
xlabel('Skupina (EDSS Group)');
ylabel('Velocity (cm/s)');
grid on;
```



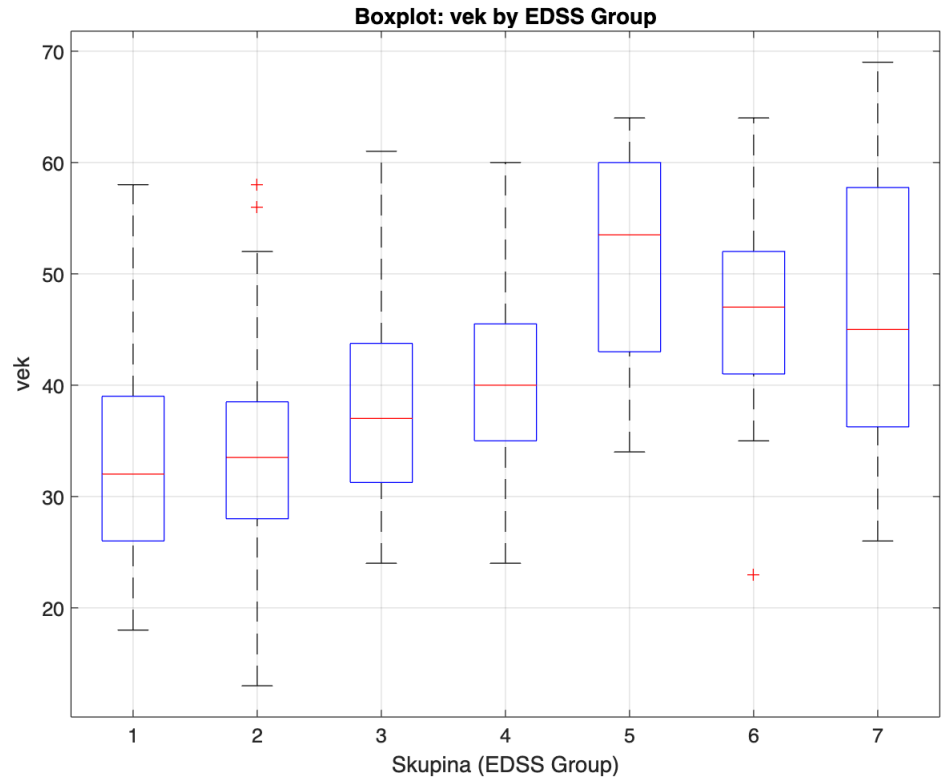

```
% Nahrávání dat a vytvoření proměnných
T = readtable('data.csv', 'HeaderLines', 2);
```

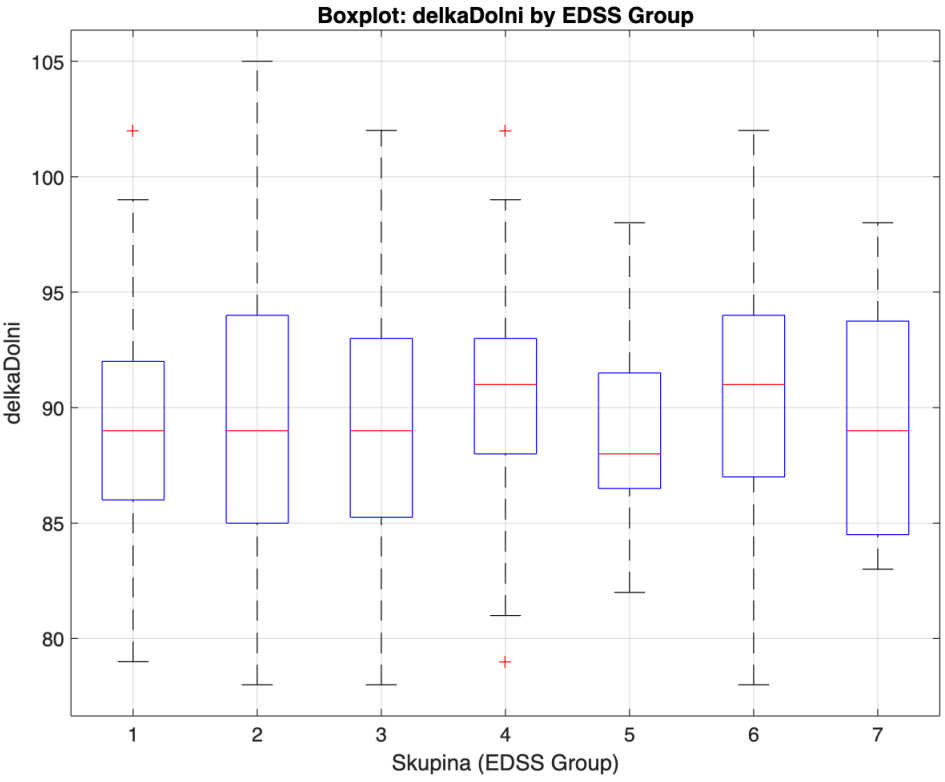
```
Warning: Column headers from the file were modified to make them valid MATLAB identifiers
before creating variable names for the table. The original column headers are saved in the
VariableDescriptions property.
Set 'VariableNamingRule' to 'preserve' to use the original column headers as table variable names.
```

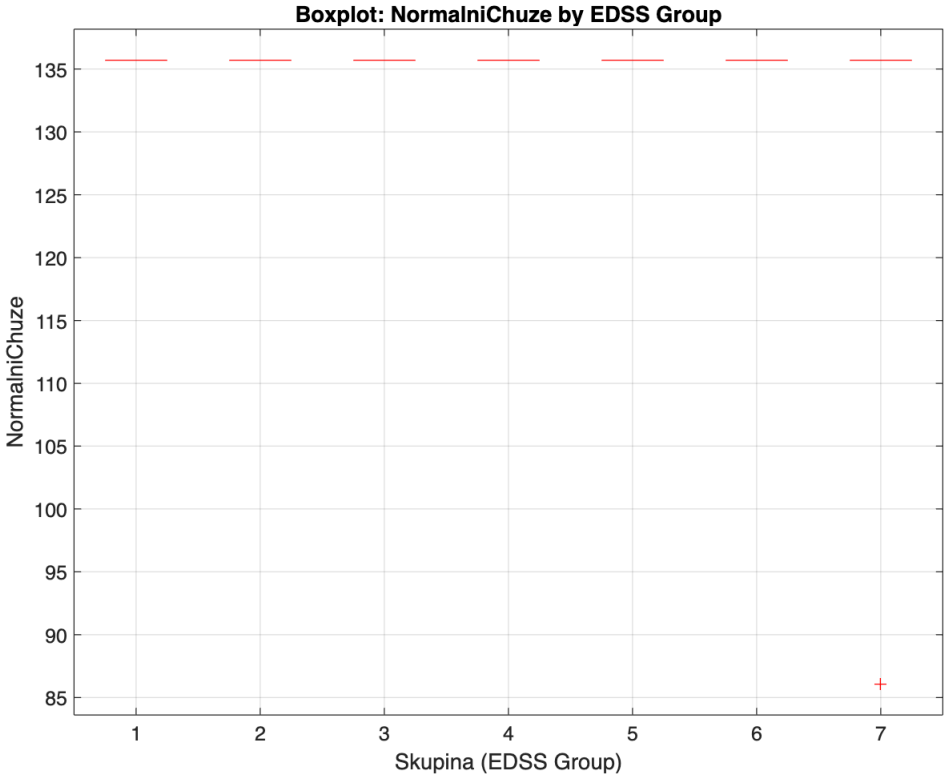
```
% Rozdělení do skupin podle EDSS
```

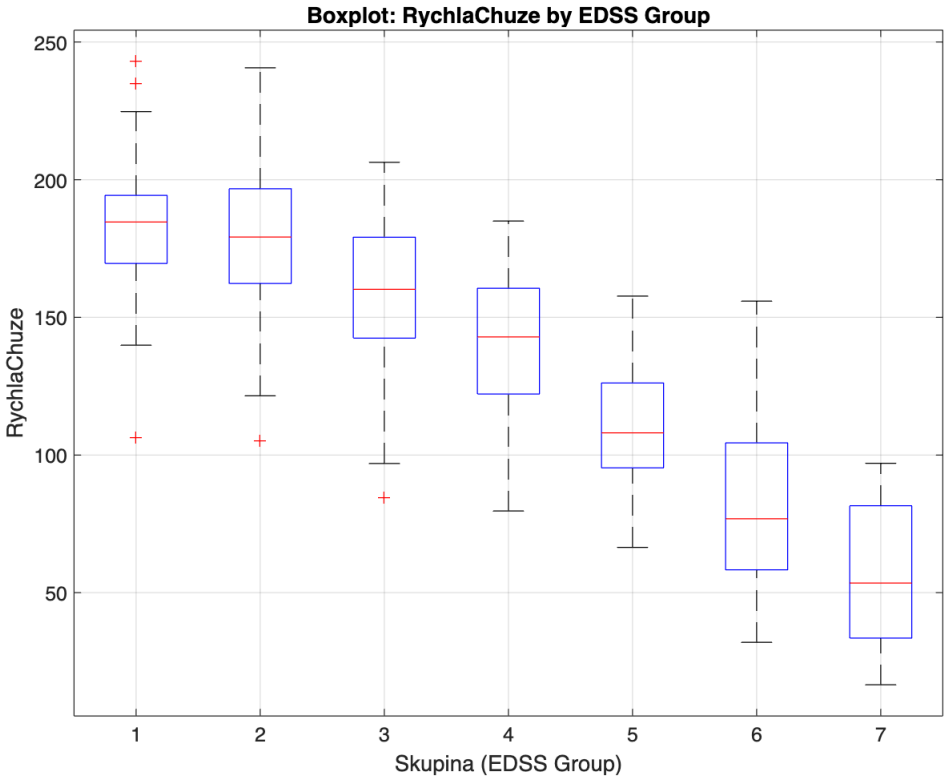
```
group1 = T(T.Skupina == 1, :);
group2 = T(T.Skupina == 2, :);
group3 = T(T.Skupina == 3, :);
group4 = T(T.Skupina == 4, :);
group5 = T(T.Skupina == 5, :);
group6 = T(T.Skupina == 6, :);
group7 = T(T.Skupina == 7, :);

% Získání názvů sloupců
colNames = T.Properties.VariableNames;

% Výběr pouze numerických sloupců (vyloučení Inicialy, EDSS, Skupina)
numericCols = colNames(4:end); % od 'vek' dál

% Vytvoření boxplotů pro každý sloupec
for i = 1:length(numericCols)
    colName = numericCols{i};

    % Extrakce dat pro aktuální sloupec ze všech skupin
    group1_data = group1.(colName);
    group2_data = group2.(colName);
    group3_data = group3.(colName);
    group4_data = group4.(colName);
    group5_data = group5.(colName);
    group6_data = group6.(colName);
    group7_data = group7.(colName);

    % Spojení všech dat
    all_data = [group1_data; group2_data; group3_data; ...
                group4_data; group5_data; group6_data; ...
                group7_data];

    % Vytvoření skupinových labelů
    group_labels = [ones(length(group1_data), 1); ...
                    ones(length(group2_data), 1)*2; ...
                    ones(length(group3_data), 1)*3; ...
                    ones(length(group4_data), 1)*4; ...
                    ones(length(group5_data), 1)*5; ...
                    ones(length(group6_data), 1)*6; ...
                    ones(length(group7_data), 1)*7];

    % Vytvoření boxplotu
    figure();
    boxplot(all_data, group_labels, 'Labels',
{'1','2','3','4','5','6','7'});
    title(['Boxplot: ', strrep(colName, '_', ' '), ' by EDSS Group']);
    xlabel('Skupina (EDSS Group)');
    ylabel(strrep(colName, '_', ' '));
    grid on;
```

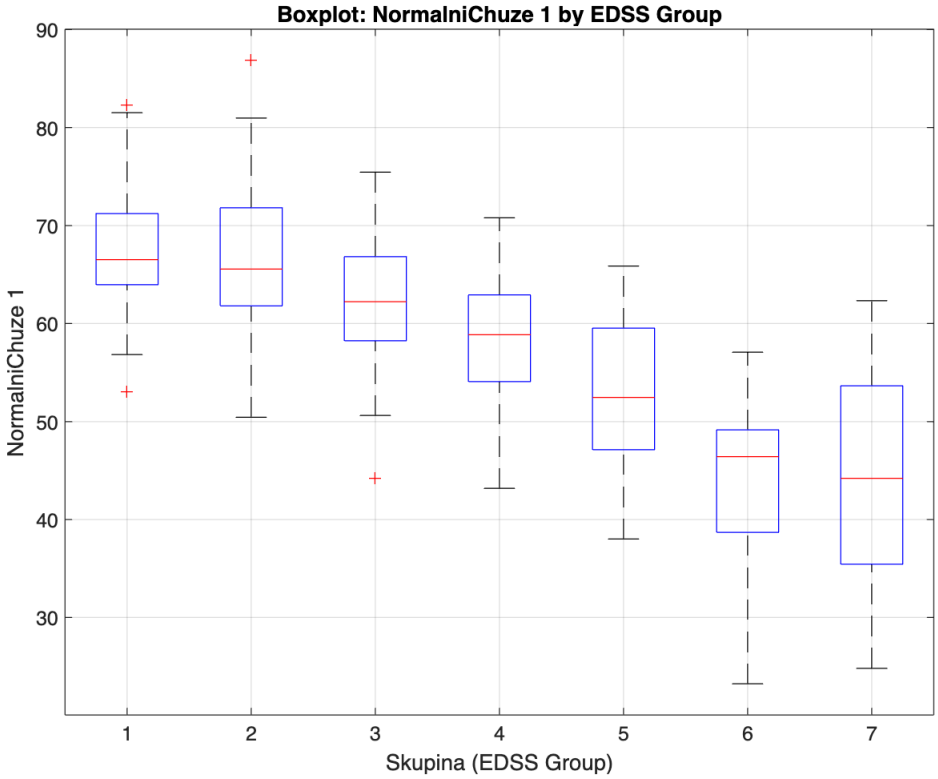
```
    % Uložení grafu (volitelné)
    % saveas(gcf, ['boxplot_', colName, '.png']);
end
```

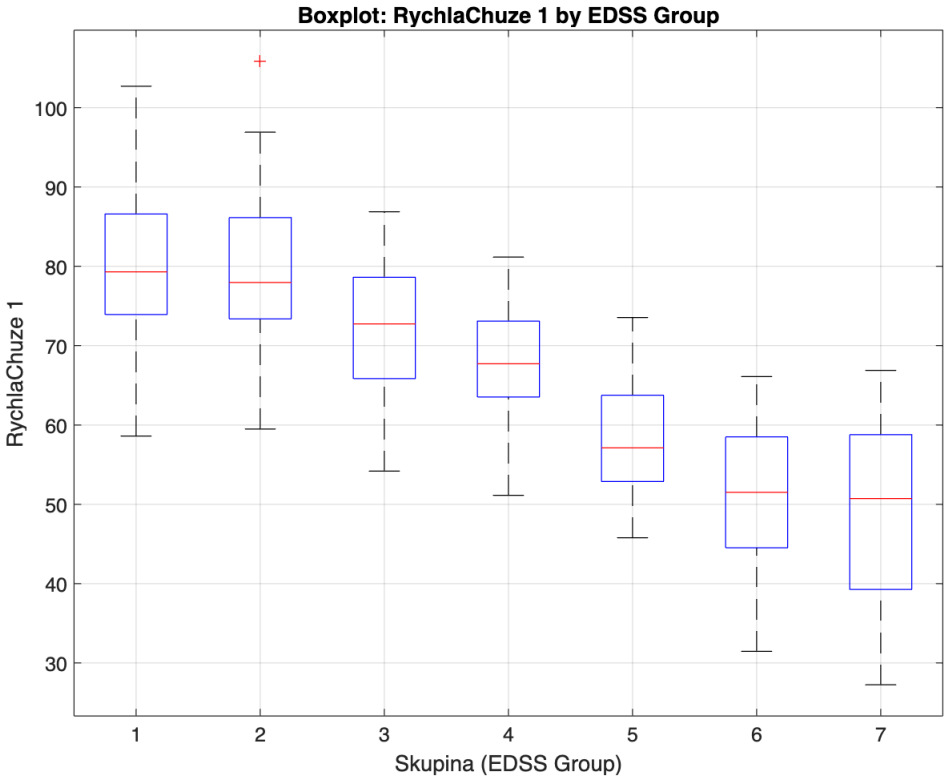


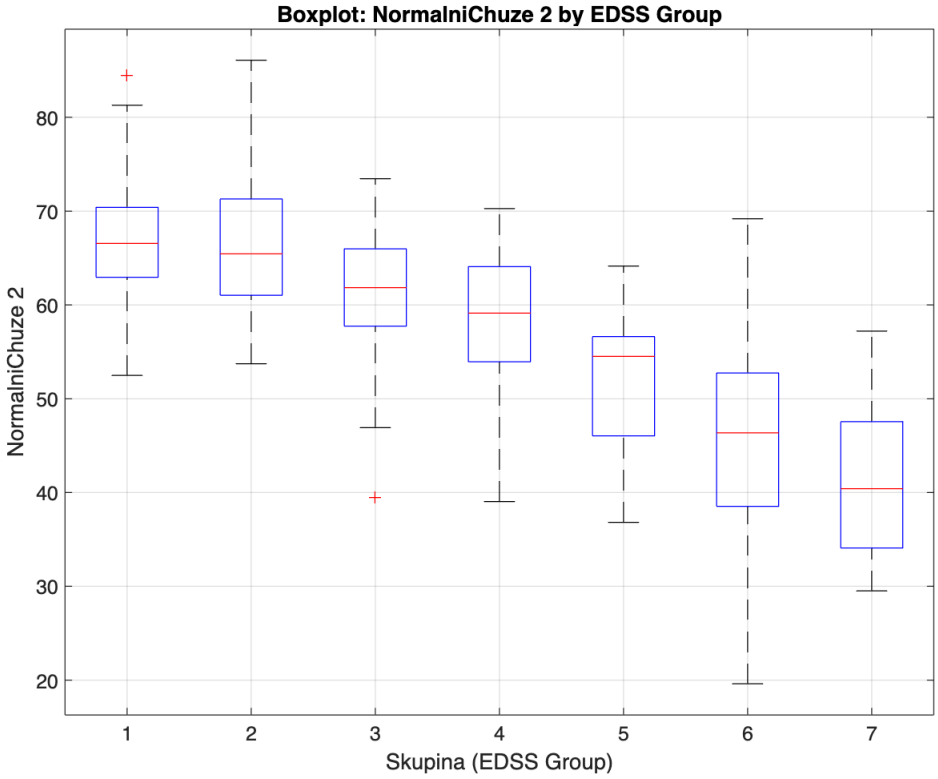


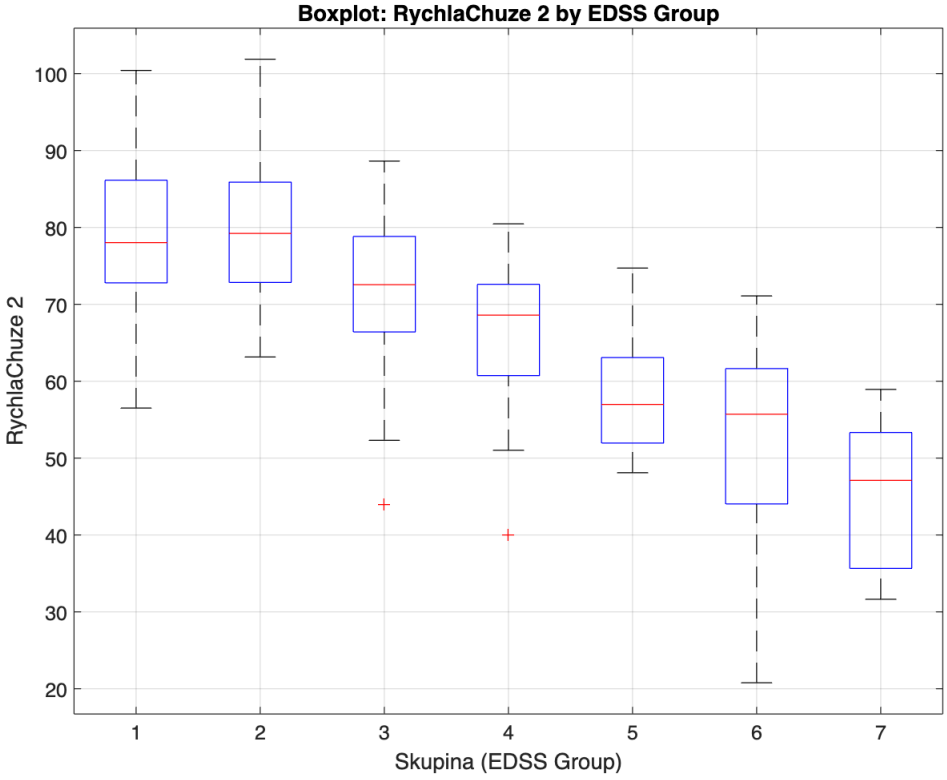

Boxplot: NormalniChuze by EDSS Group
NormalniChuze
135
130
125
120
115
110
105
100
95
90
85
1
2
3
4
5
6
7
Skupina (EDSS Group)

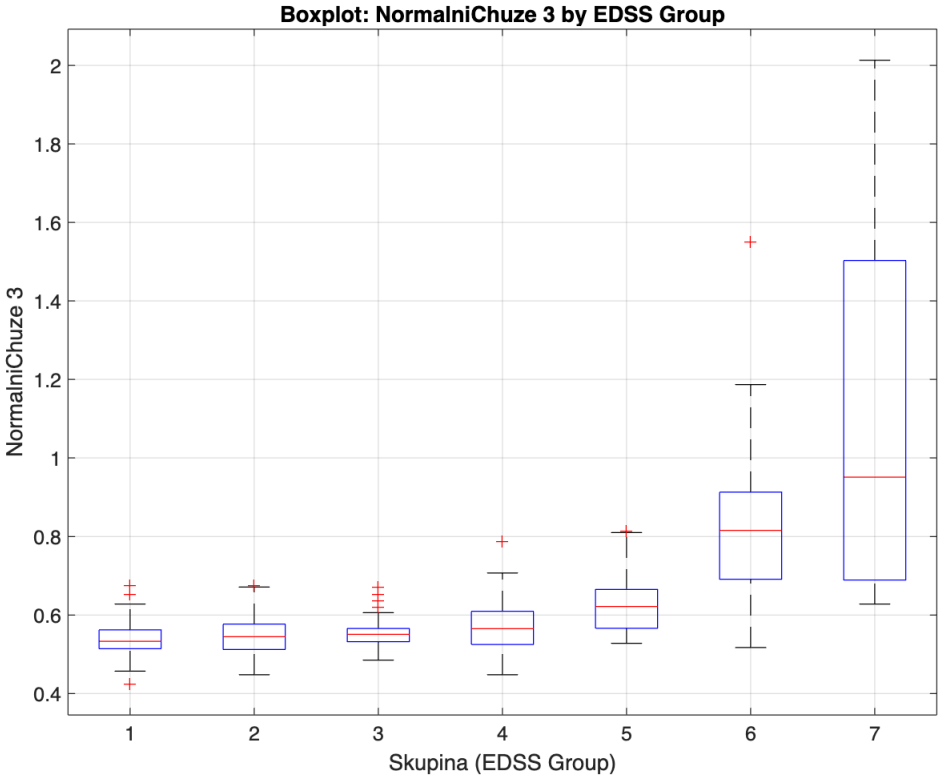

Boxplot: RychlaChuze by EDSS Group
RychlaChuze
250
200
150
100
50
1
2
3
4
5
6
7
Skupina (EDSS Group)

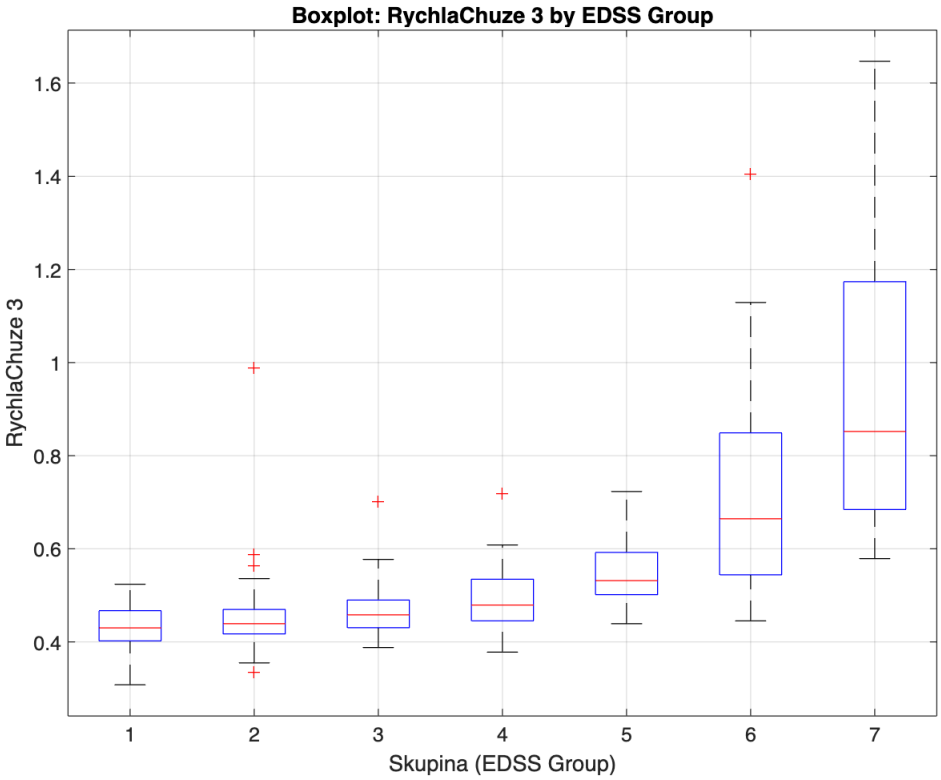

Boxplot: NormalniChuze 1 by EDSS Group
NormalniChuze 1
Skupina (EDSS Group)
90
80
70
60
50
40
30
1
2
3
4
5
6
7

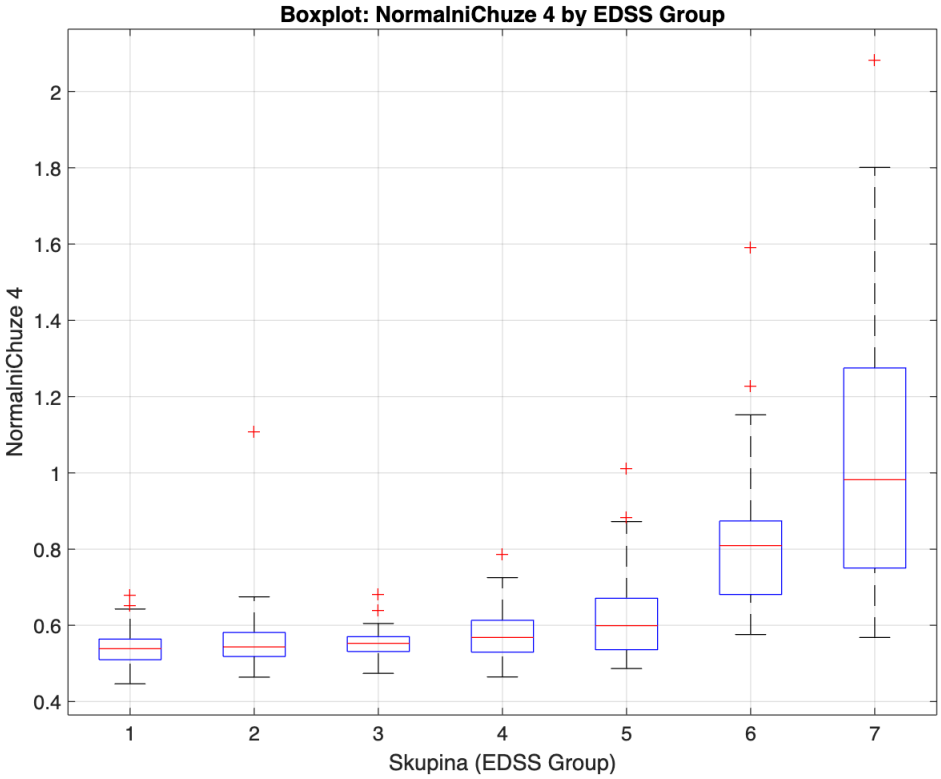

Boxplot: RychlaChuze 1 by EDSS Group
RychlaChuze 1
Skupina (EDSS Group)
100
90
80
70
60
50
40
30
1
2
3
4
5
6
7

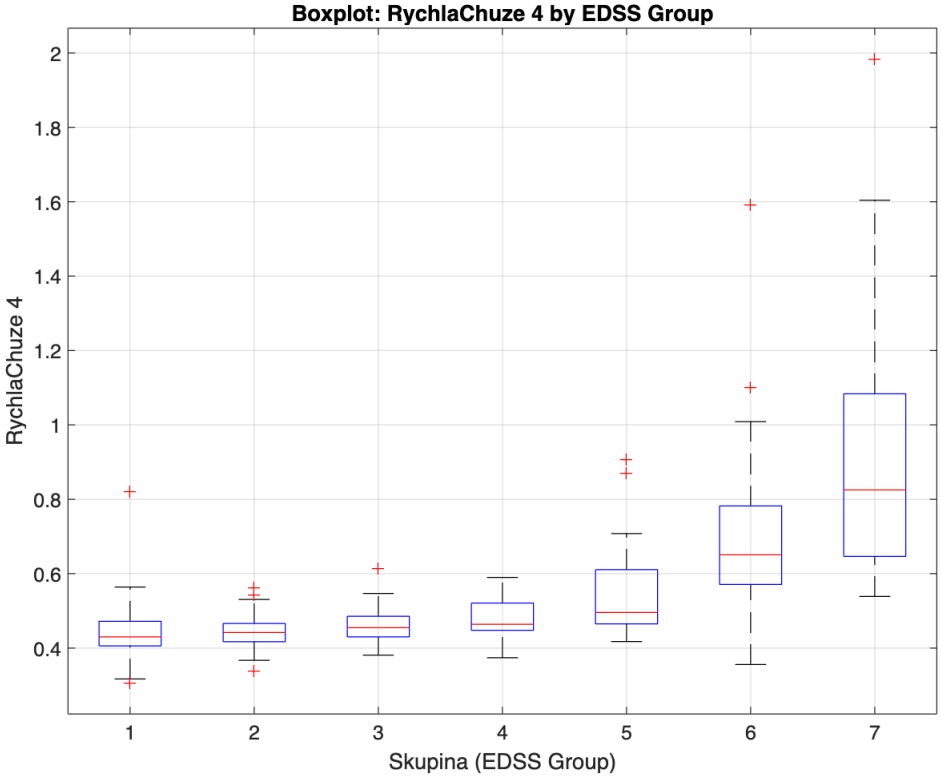

Boxplot: NormalniChuze 2 by EDSS Group
NormalniChuze 2
Skupina (EDSS Group)
20
30
40
50
60
70
80
1
2
3
4
5
6
7

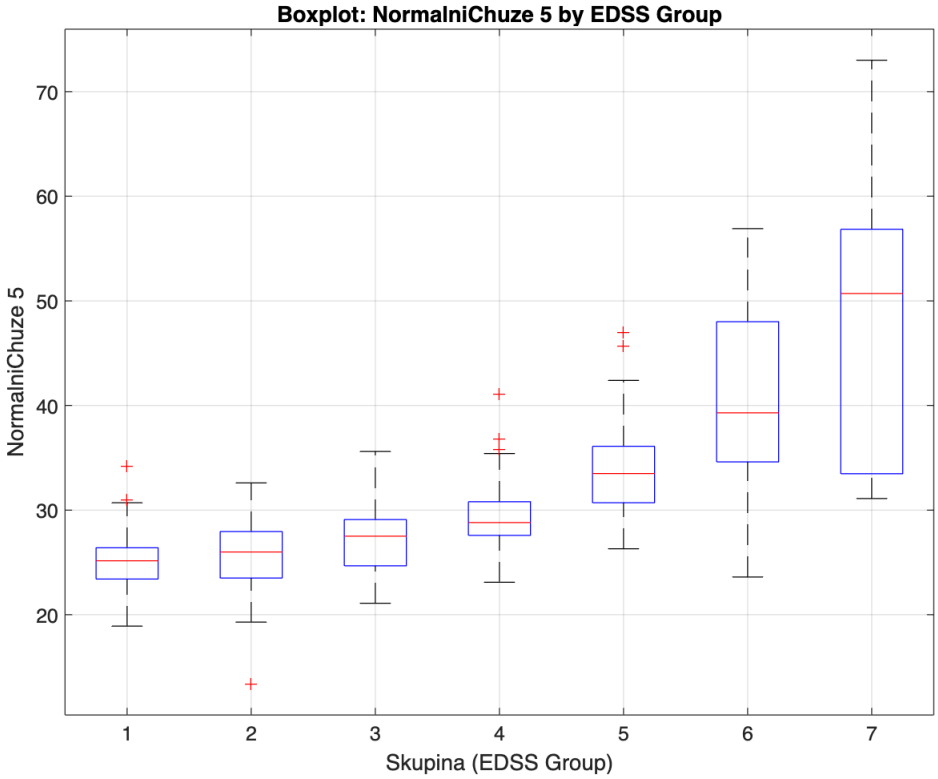

Boxplot: RychlaChuze 2 by EDSS Group
RychlaChuze 2
Skupina (EDSS Group)
20
30
40
50
60
70
80
90
100
1
2
3
4
5
6
7

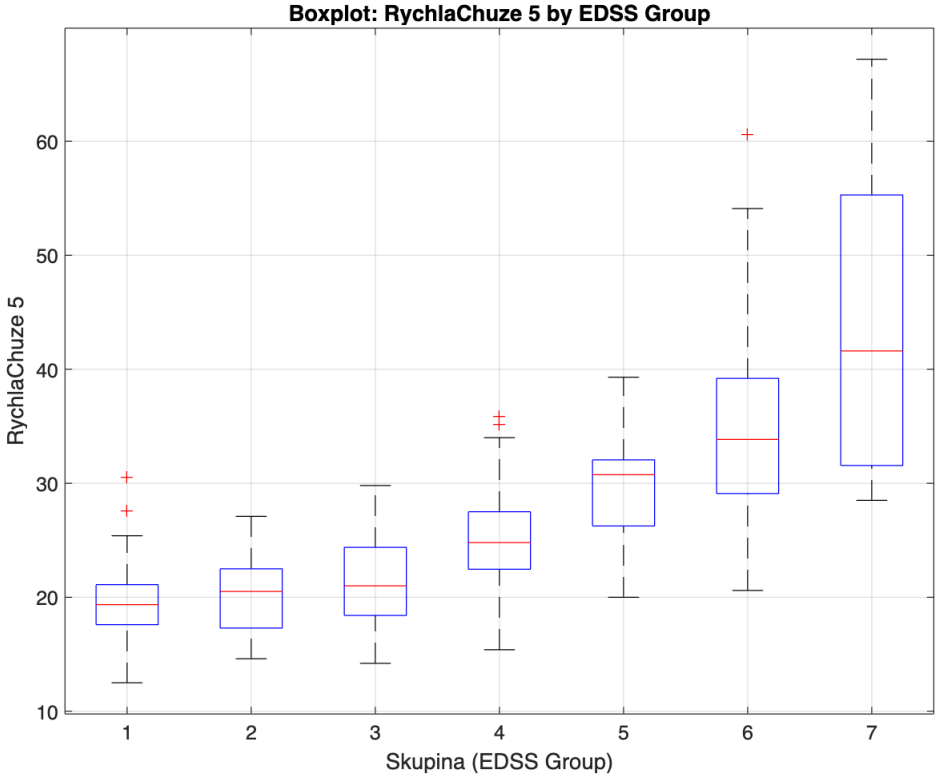

Boxplot: NormalniChuze 3 by EDSS Group
NormalniChuze 3
Skupina (EDSS Group)
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
1
2
3
4
5
6
7

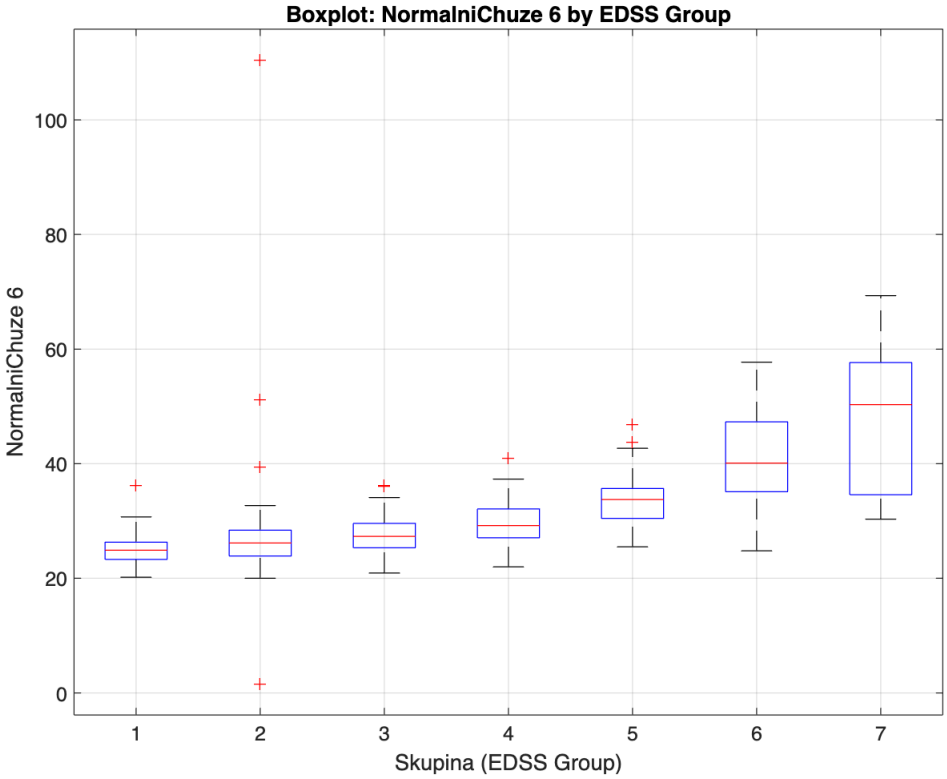

Boxplot: RychlaChuze 3 by EDSS Group
RychlaChuze 3
Skupina (EDSS Group)
1.6
1.4
1.2
1
0.8
0.6
0.4
1
2
3
4
5
6
7

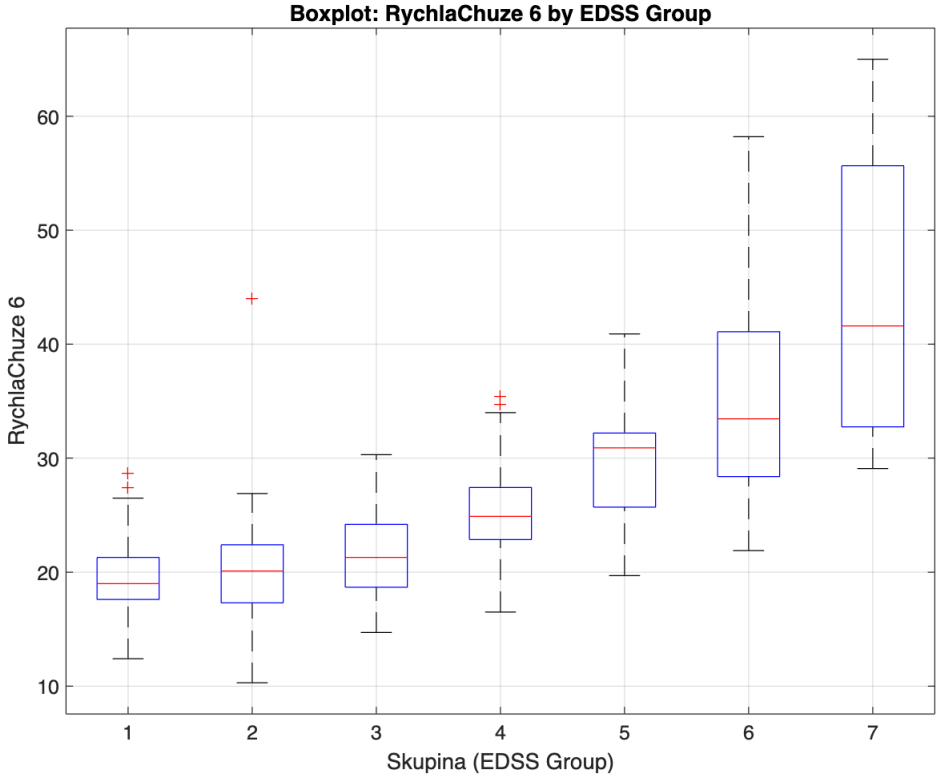

Boxplot: NormalniChuze 4 by EDSS Group
NormalniChuze 4
Skupina (EDSS Group)
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
1
2
3
4
5
6
7

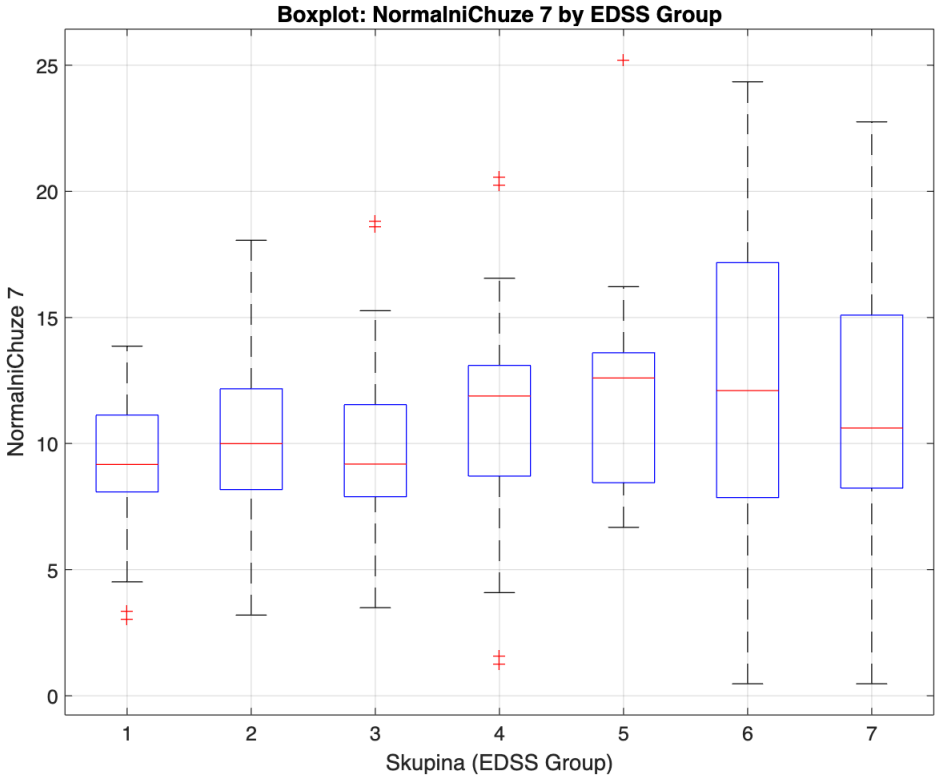

Boxplot: RychlaChuze 4 by EDSS Group
RychlaChuze 4
Skupina (EDSS Group)
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
1
2
3
4
5
6
7

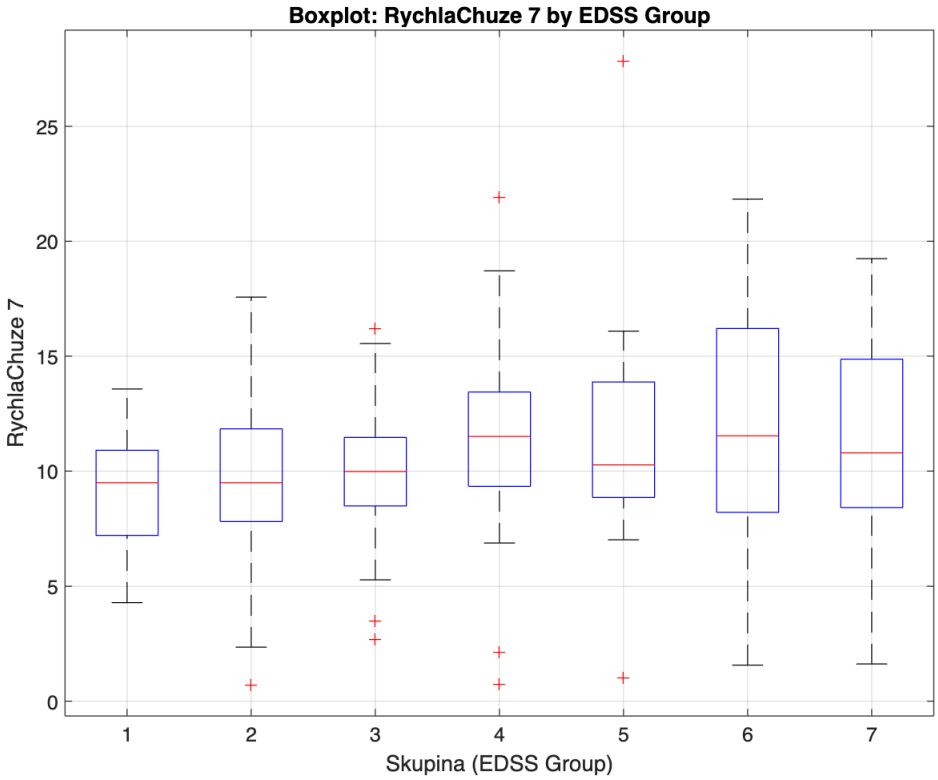

Boxplot: NormalniChuze 5 by EDSS Group
NormalniChuze 5
Skupina (EDSS Group)
70
60
50
40
30
20
1
2
3
4
5
6
7

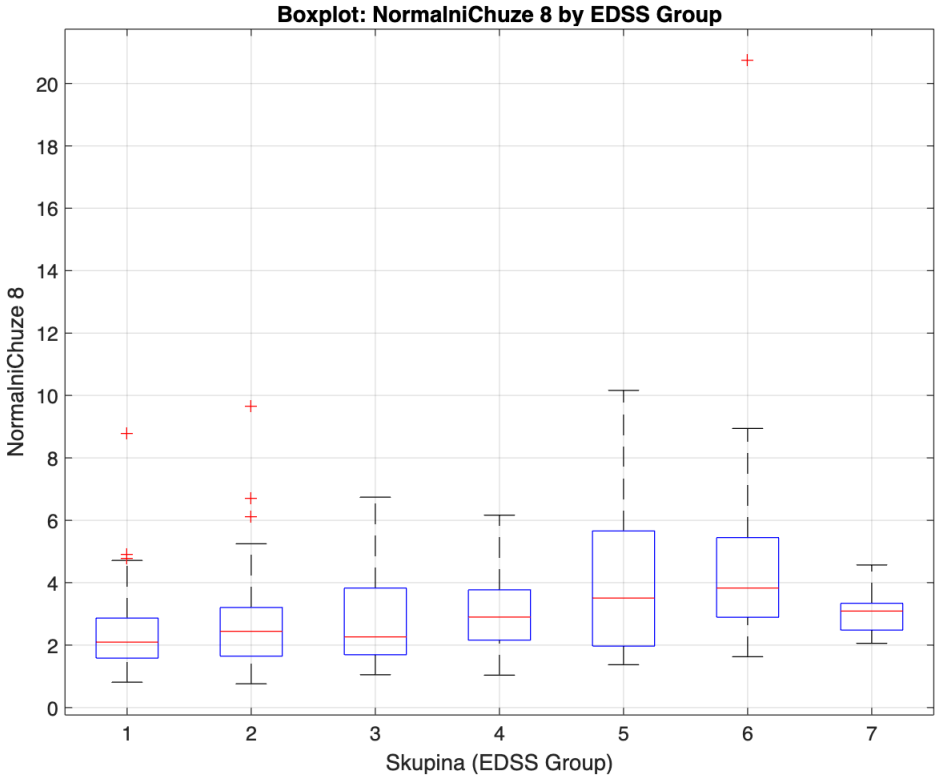

Boxplot: RychlaChuze 5 by EDSS Group
RychlaChuze 5
Skupina (EDSS Group)
60
50
40
30
20
10
1
2
3
4
5
6
7

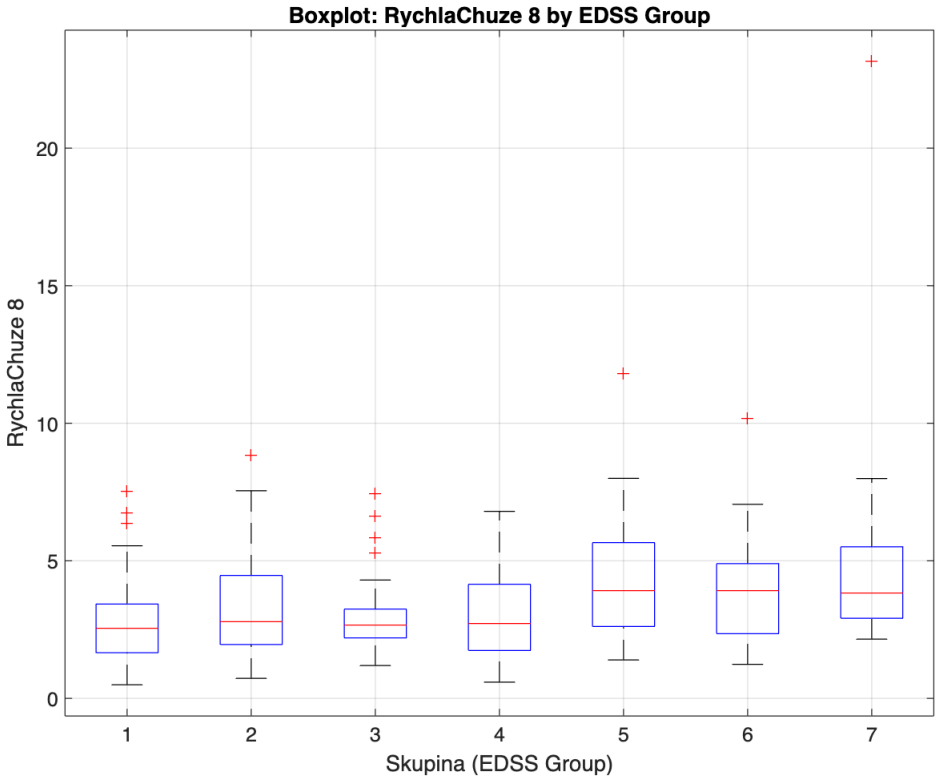

Boxplot: NormalniChuze 6 by EDSS Group
NormalniChuze 6
Skupina (EDSS Group)
0
20
40
60
80
100
1
2
3
4
5
6
7

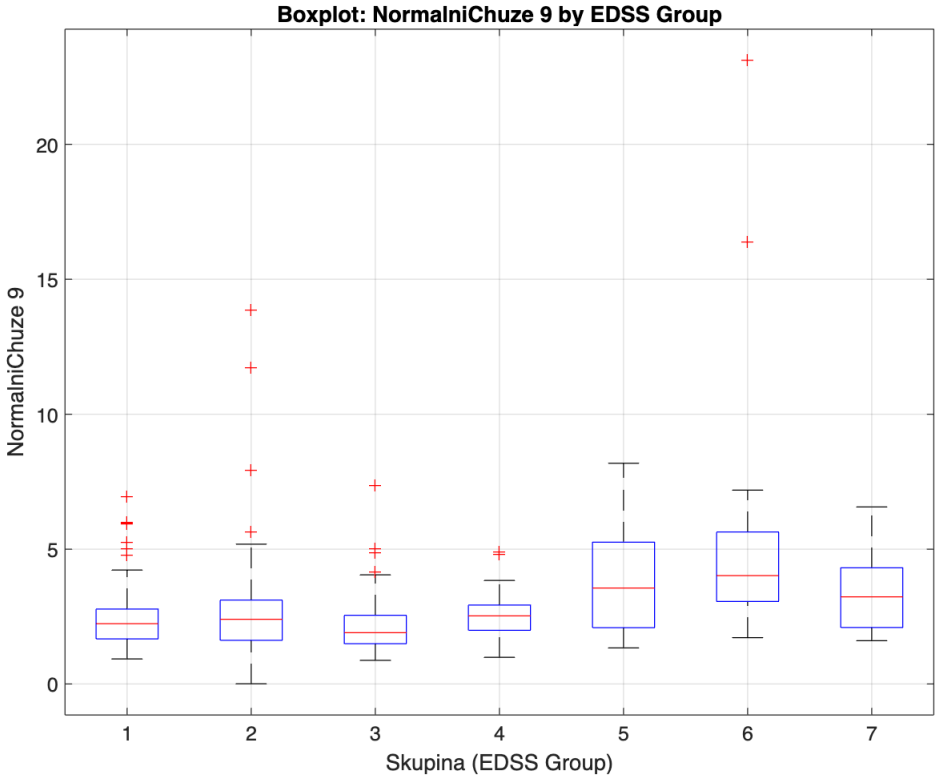

Boxplot: RychlaChuze 6 by EDSS Group
RychlaChuze 6
Skupina (EDSS Group)
10
20
30
40
50
60
1
2
3
4
5
6
7

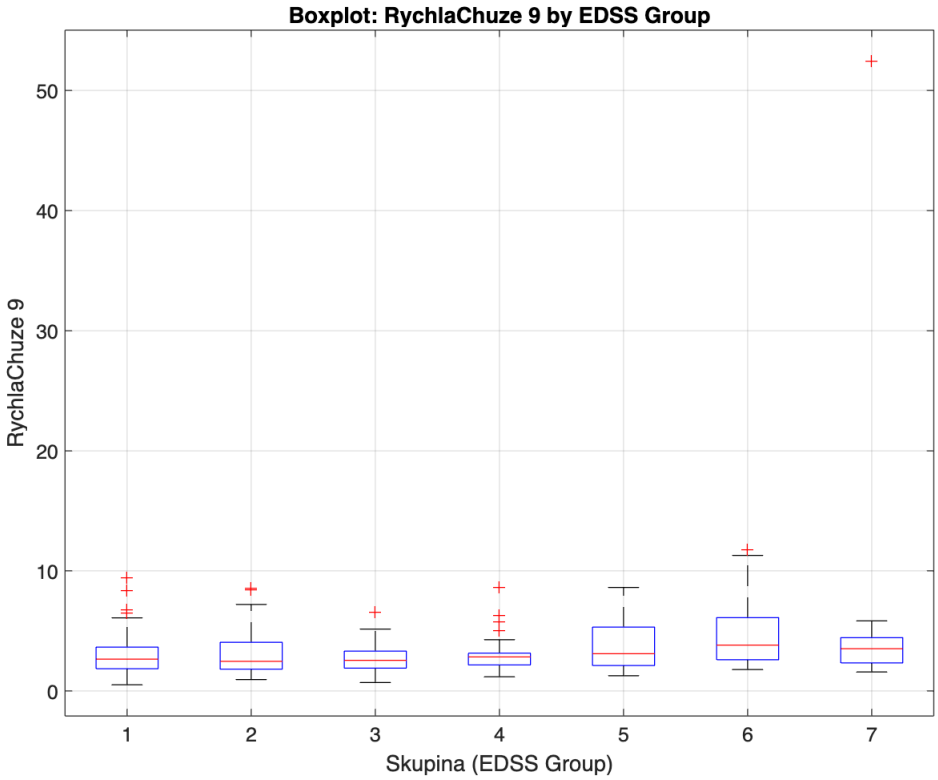

Boxplot: NormalniChuze 7 by EDSS Group
NormalniChuze 7
Skupina (EDSS Group)
0
5
10
15
20
25
1
2
3
4
5
6
7

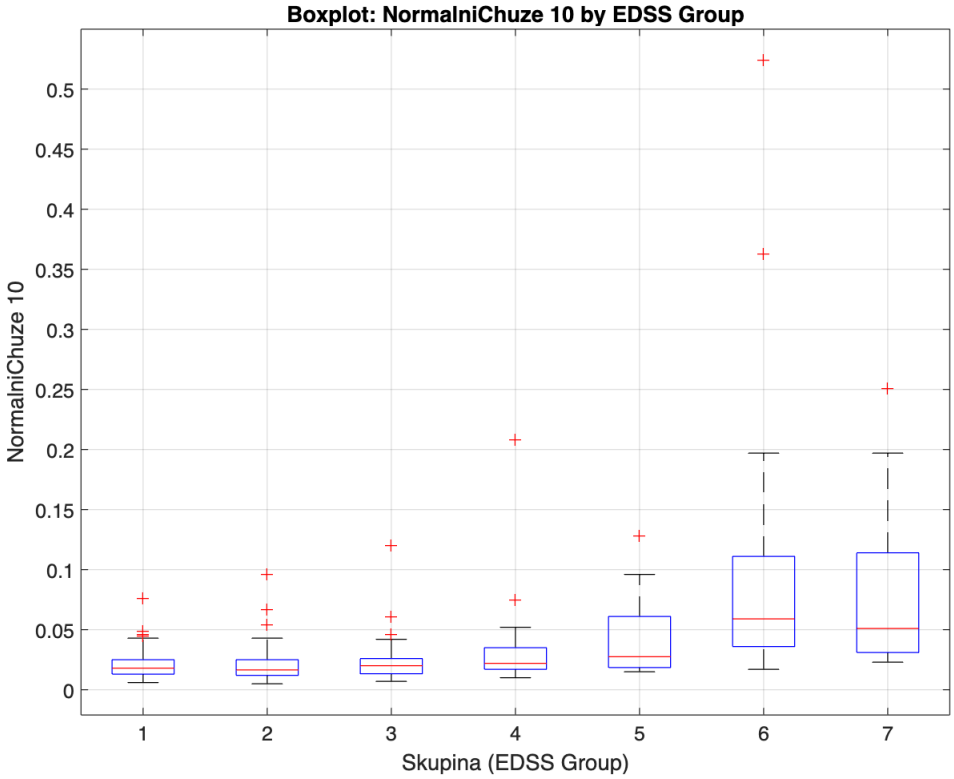

Boxplot: RychlaChuze 7 by EDSS Group
RychlaChuze 7
Skupina (EDSS Group)
0
5
10
15
20
25
1
2
3
4
5
6
7

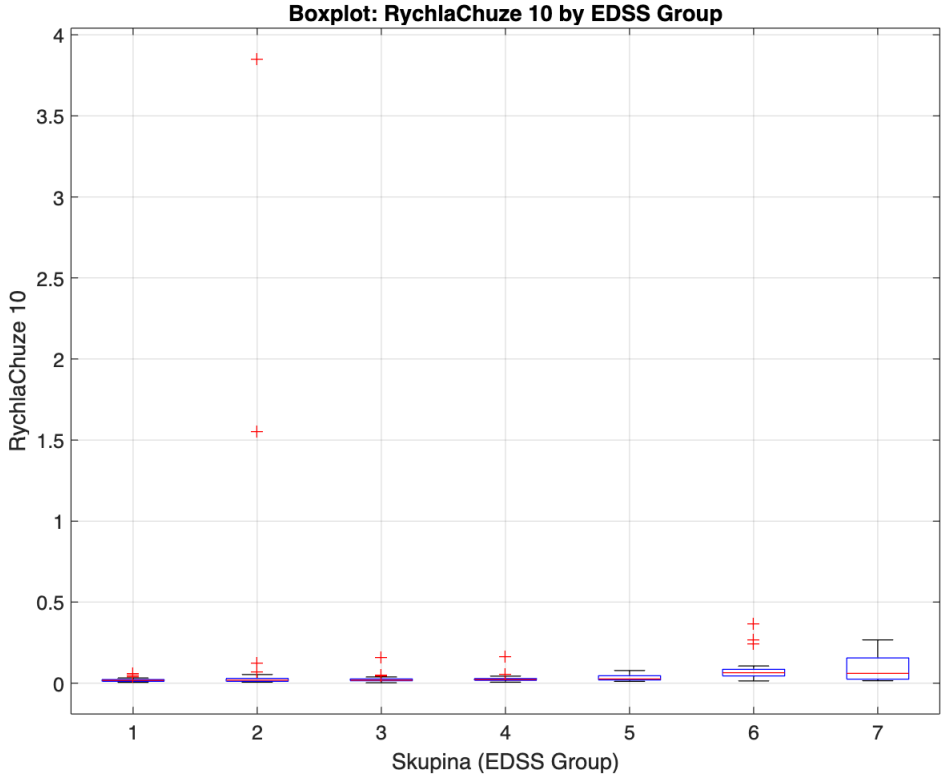

Boxplot: NormalniChuze 8 by EDSS Group
NormalniChuze 8
Skupina (EDSS Group)
0
2
4
6
8
10
12
14
16
18
20
1
2
3
4
5
6
7

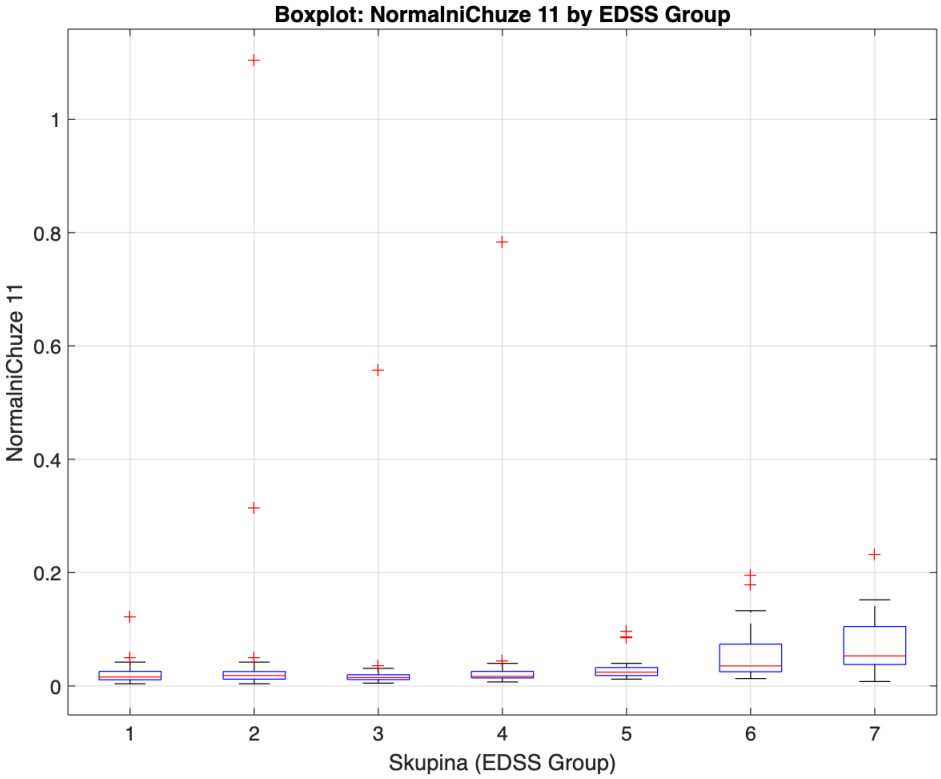

Boxplot: RychlaChuze 8 by EDSS Group
RychlaChuze 8
Skupina (EDSS Group)
0
5
10
15
20
1
2
3
4
5
6
7

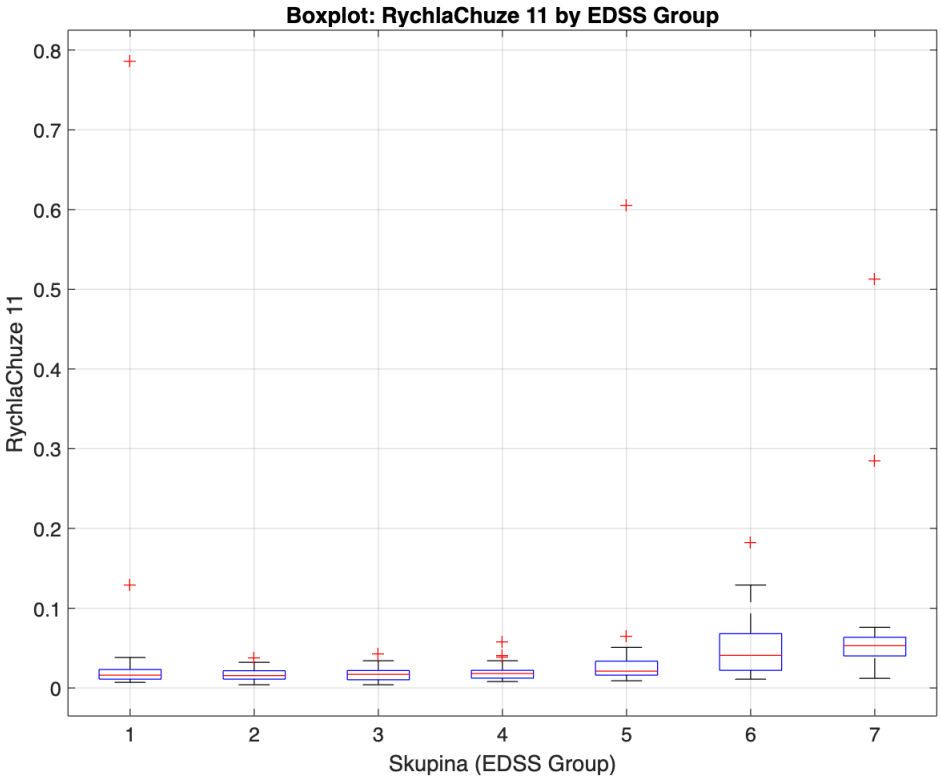

Boxplot: NormalniChuze 9 by EDSS Group
NormalniChuze 9
Skupina (EDSS Group)
0
5
10
15
20
1
2
3
4
5
6
7

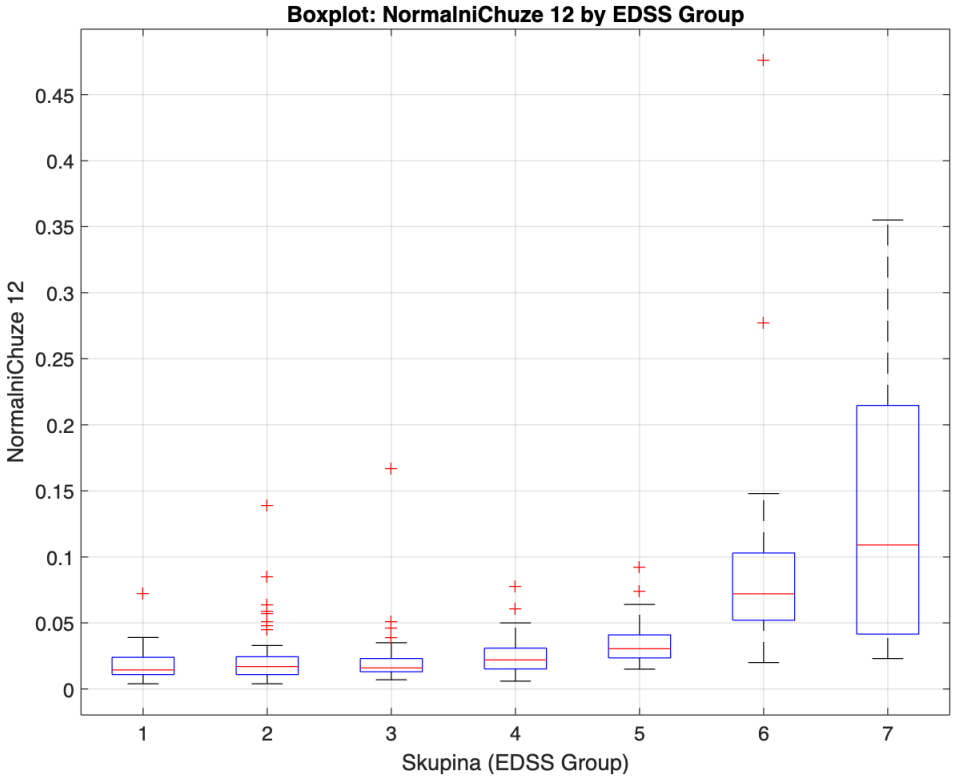

Boxplot: RychlaChuze 9 by EDSS Group
RychlaChuze 9
Skupina (EDSS Group)
0
10
20
30
40
50
1
2
3
4
5
6
7

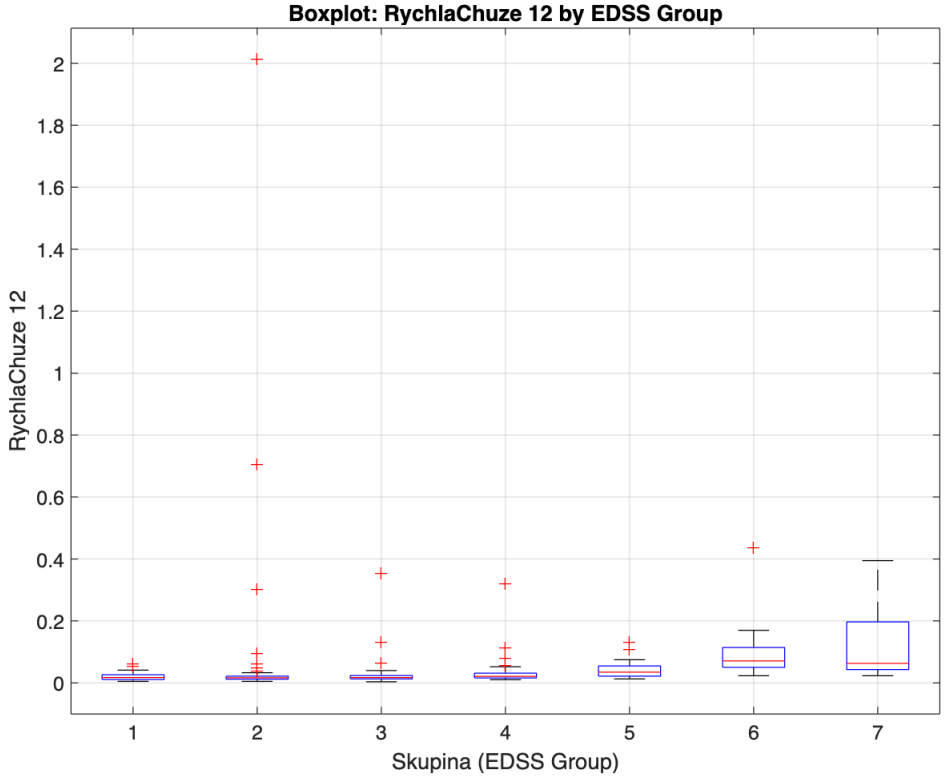

Boxplot: NormalniChuze 10 by EDSS Group
NormalniChuze 10
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1
2
3
4
5
6
7
Skupina (EDSS Group)

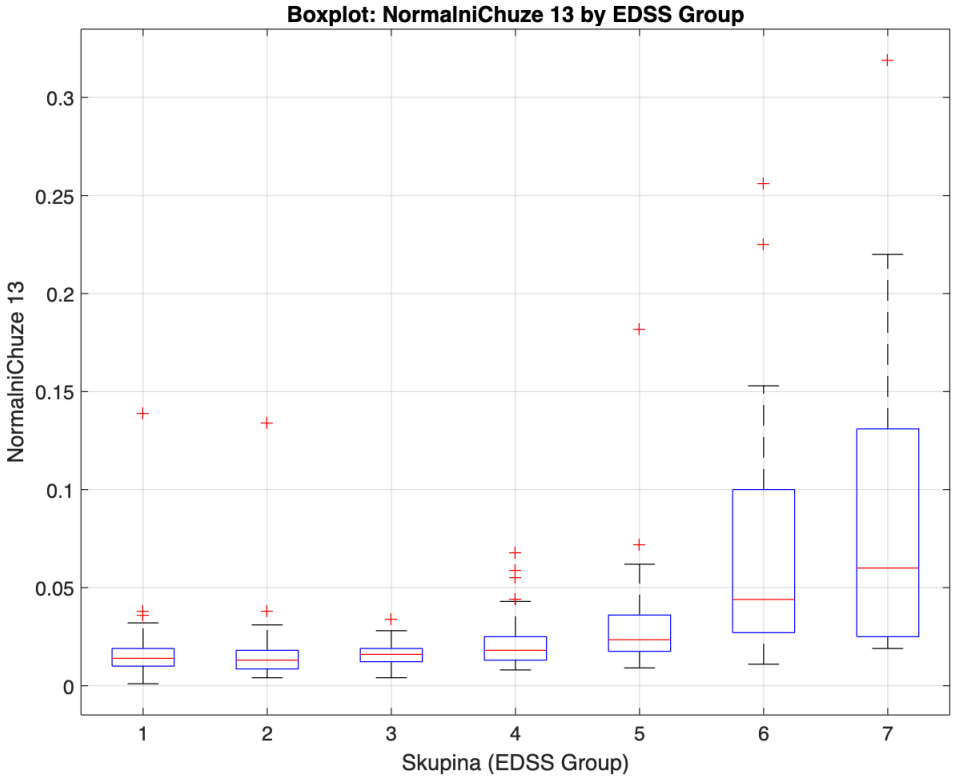

Boxplot: RychlaChuze 10 by EDSS Group
RychlaChuze 10
4
3.5
3
2.5
2
1.5
1
0.5
0
1
2
3
4
5
6
7
Skupina (EDSS Group)

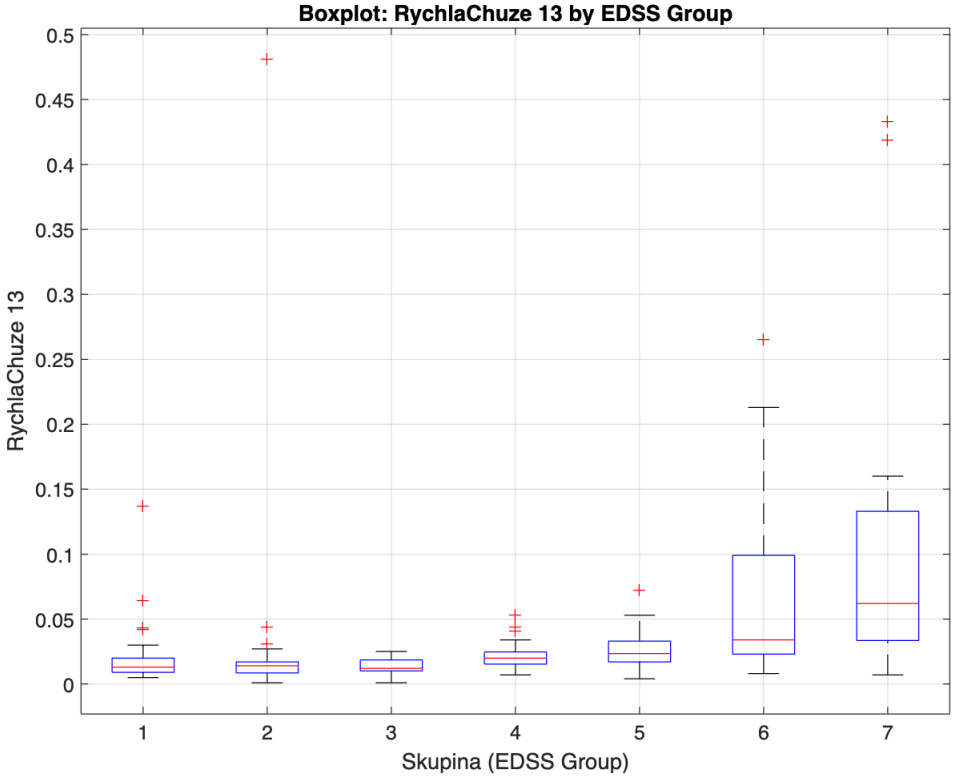

Boxplot: NormalniChuze 11 by EDSS Group
NormalniChuze 11
Skupina (EDSS Group)
0
0.2
0.4
0.6
0.8
1
1
2
3
4
5
6
7


Boxplot: RychlaChuze 11 by EDSS Group
RychlaChuze 11
Skupina (EDSS Group)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
1
2
3
4
5
6
7


Boxplot: NormalniChuze 12 by EDSS Group
NormalniChuze 12
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1
2
3
4
5
6
7
Skupina (EDSS Group)


Boxplot: RychlaChuze 12 by EDSS Group
RychlaChuze 12
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1
2
3
4
5
6
7
Skupina (EDSS Group)






```
data1 = readtable('data.xls', 'VariableNamingRule', 'preserve');
```