## Supplementary Table S1. Demographics, comorbidities and specialty of diagnosis in patients with different SSD and FSS after propensity score weighting

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 　 | Overall SSD and FSS | Somatic symptom disorders | Irritable bowel syndrome | Functional dyspepsia | Fibromyalgia | Chronic fatigue syndrome | Controls |
| 　 | 2571640 | 59119 | 451595 | 596680 | 1182059 | 282187 | 2571640 |
| 　 | N (%) | N (%) | N (%) | N (%) | N (%) | N (%) | N (%) |
| **Age (years)** |  |  |  |  |  |  |  |
| 18-34 | 515,619 (20.1) | 11,858 (20.1) | 90,545 (20.1) | 119,634 (20.1) | 237,003 (20.1) | 56,578 (20.1) | 515,614 (20.1) |
| 35-44 | 429,463 (16.7) | 9,872 (16.7) | 75,416 (16.7) | 99,646 (16.7) | 197,404 (16.7) | 47,125 (16.7) | 429,464 (16.7) |
| 45-54 | 548,536 (21.3) | 12,615 (21.3) | 96,325 (21.3) | 127,272 (21.3) | 252,133 (21.3) | 60,190 (21.3) | 548,531 (21.3) |
| 55-64 | 491,182 (19.1) | 11,291 (19.1) | 86,255 (19.1) | 113,966 (19.1) | 225,773 (19.1) | 53,898 (19.1) | 491,183 (19.1) |
| >=65 | 586,841 (22.8) | 13,484 (22.8) | 103,054 (22.8) | 136,162 (22.8) | 269,746 (22.8) | 64,395 (22.8) | 586,848 (22.8) |
| **Sex**  |  |  |  |  |  |  |  |
| Female | 1,133,579 (44.1) | 26,060 (44.1) | 199,063 (44.1) | 263,017 (44.1) | 521,052 (44.1) | 124,388 (44.1) | 1,133,579 (44.1) |
| Male | 1,438,061 (55.9) | 33,059 (55.9) | 252,532 (55.9) | 333,663 (55.9) | 661,007 (55.9) | 157,799 (55.9) | 1,438,061 (55.9) |
| **Monthly Income (USD)** |  |  |  |  |  |  |  |
| <=20000 | 643,681 (25.0) | 14,797 (25.0) | 113,034 (25.0) | 149,349 (25.0) | 295,869 (25.0) | 70,631 (25.0) | 643,681 (25.0) |
| 20001-40000 | 1,316,165 (51.2) | 30,257 (51.2) | 231,126 (51.2) | 305,381 (51.2) | 604,978 (51.2) | 144,423 (51.2) | 1,316,165 (51.2) |
| >40001 | 611,793 (23.8) | 14,064 (23.8) | 107,434 (23.8) | 141,950 (23.8) | 281,212 (23.8) | 67,132 (23.8) | 611,793 (23.8) |
| **Charlson comorbidity index** |  |  |  |  |  |  |  |
| 0 | 2,022,858 (78.7) | 46,509 (78.7) | 355,225 (78.7) | 469,348 (78.7) | 929,808 (78.7) | 221,968 (78.7) | 2,022,852 (78.7) |
| 1 | 339,199 (13.2) | 7,798 (13.2) | 59,565 (13.2) | 78,702 (13.2) | 155,914 (13.2) | 37,220 (13.2) | 339,199 (13.2) |
| 2 | 128,833 (5.0) | 2,956 (5.0) | 22,625 (5.0) | 29,894 (5.0) | 59,221 (5.0) | 14,138 (5.0) | 128,839 (5.0) |
| >=3 | 80,749 (3.1) | 1,856 (3.1) | 14,180 (3.1) | 18,736 (3.1) | 37,117 (3.1) | 8,861 (3.1) | 80,749 (3.1) |
| **Number of outpatient visits**  |  |  |  |  |  |  |  |
| 0-10 | 1,330,086 (51.7) | 30,582 (51.7) | 233,565 (51.7) | 308,603 (51.7) | 611,361 (51.7) | 145,975 (51.7) | 1,330,052 (51.7) |
| 11-20 | 533,358 (20.7) | 12,261 (20.7) | 93,661 (20.7) | 123,751 (20.7) | 245,159 (20.7) | 58,526 (20.7) | 533,358 (20.7) |
| >=21 | 708,196 (27.5) | 16,275 (27.5) | 124,369 (27.5) | 164,326 (27.5) | 325,539 (27.5) | 77,686 (27.5) | 708,230 (27.5) |
| **Comorbidity**  |  |  |  |  |  |  |  |
| Hypertension | 527,701 (20.5) | 12,131 (20.5) | 92,667 (20.5) | 122,439 (20.5) | 242,559 (20.5) | 57,905 (20.5) | 527,701 (20.5) |
| Dyslipidemia | 294,453 (11.5) | 6,769 (11.5) | 51,708 (11.5) | 68,320 (11.5) | 135,346 (11.5) | 32,310 (11.5) | 294,453 (11.5) |
| Diabetes  | 85,121 (3.3) | 1,957 (3.3) | 14,948 (3.3) | 19,750 (3.3) | 39,126 (3.3) | 9,340 (3.3) | 85,121 (3.3) |
| Chronic liver disease  | 135,783 (5.3) | 3,121 (5.3) | 23,844 (5.3) | 31,505 (5.3) | 62,413 (5.3) | 14,899 (5.3) | 135,783 (5.3) |
| Chronic kidney disease  | 40,375 (1.6) | 928 (1.6) | 7,090 (1.6) | 9,368 (1.6) | 18,558 (1.6) | 4,430 (1.6) | 40,375 (1.6) |
| Chronic pulmonary disease | 121,896 (4.7) | 2,802 (4.7) | 21,406 (4.7) | 28,283 (4.7) | 56,030 (4.7) | 13,376 (4.7) | 121,896 (4.7) |
| Cardiovascular disorder  | 49,890 (1.9) | 1,147 (1.9) | 8,761 (1.9) | 11,576 (1.9) | 22,932 (1.9) | 5,474 (1.9) | 49,890 (1.9) |
| Peptic ulcer disease | 175,643 (6.8) | 4,038 (6.8) | 30,844 (6.8) | 40,753 (6.8) | 80,735 (6.8) | 19,273 (6.8) | 175,643 (6.8) |
| Cerebrovascular disease | 86,921 (3.4) | 1,998 (3.4) | 15,264 (3.4) | 20,168 (3.4) | 39,954 (3.4) | 9,538 (3.4) | 86,921 (3.4) |
| Peripheral vascular disease | 21,602 (0.8) | 497 (0.8) | 3,793 (0.8) | 5,012 (0.8) | 9,929 (0.8) | 2,370 (0.8) | 21,602 (0.8) |
| Rheumatoid arthritis | 25,202 (1.0) | 579 (1.0) | 4,426 (1.0) | 5,847 (1.0) | 11,584 (1.0) | 2,765 (1.0) | 25,202 (1.0) |
| Depression | 71,498 (2.8) | 1,649 (2.8) | 12,554 (2.8) | 16,588 (2.8) | 32,861 (2.8) | 7,845 (2.8) | 71,749 (2.8) |
| Sleep | 198,121 (7.7) | 4,552 (7.7) | 34,818 (7.7) | 46,004 (7.7) | 91,019 (7.7) | 21,728 (7.7) | 198,273 (7.7) |
| Anxiety | 47,284 (1.8) | 1,082 (1.8) | 8,309 (1.8) | 10,979 (1.8) | 21,750 (1.8) | 5,164 (1.8) | 47,318 (1.8) |
| Substance and alcohol use disorder | 6,943 (0.3) | 160 (0.3) | 1,219 (0.3) | 1,611 (0.3) | 3,192 (0.3) | 762 (0.3) | 6,943 (0.3) |

## Supplementary Table S2. Demographics, comorbidities and specialty of diagnosis in patients with different SSD and FSS

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 　 | Overall | MS | RA | IBD | Controls |
|  | 4415 | 351 | 910 | 3154 | 4415 |
| 　 | N (%) | N (%) | N (%) | N (%) | N (%) |
| **Age**  |  |  |  |  |  |
| 18-34 | 759 (17.2) | 121 (34.5) | 102 (11.2) | 531 (16.8) | 754 (17.1) |
| 35-44 | 613 (13.9) | 82 (23.4) | 121 (13.3) | 401 (12.7) | 604 (13.7) |
| 45-54 | 705 (16.0) | 81 (23.1) | 151 (16.6) | 488 (15.5) | 720 (16.3) |
| 55-64 | 782 (17.7) | 37 (10.5) | 199 (21.9) | 539 (17.1) | 775 (17.6) |
| >=65 | 1,556 (35.2) | 30 (8.5) | 337 (37.0) | 1,195 (37.9) | 1,562 (35.4) |
| **Sex**  |  |  |  |  |  |
| Female | 2,380 (53.9) | 256 (72.9) | 644 (70.8) | 1,480 (46.9) | 2,380 (53.9) |
| Male | 2,035 (46.1) | 95 (27.1) | 266 (29.2) | 1,674 (53.1) | 2,035 (46.1) |
| **Monthly Income** |  |  |  |  |  |
| <=20000 | 1,194 (27.0) | 96 (27.4) | 238 (26.2) | 934 (29.6) | 1,268 (28.7) |
| 20001-40000 | 2,313 (52.4) | 181 (51.6) | 502 (55.2) | 1,665 (52.8) | 2,348 (53.2) |
| >40001 | 908 (20.6) | 74 (21.1) | 170 (18.7) | 555 (17.6) | 799 (18.1) |
| **Charlson comorbid index** |  |  |  |  |  |
| 0 | 3,098 (70.2) | 211 (60.1) | 375 (41.2) | 1,489 (47.2) | 2,075 (47.0) |
| 1 | 723 (16.4) | 86 (24.5) | 263 (28.9) | 710 (22.5) | 1,059 (24.0) |
| 2 | 340 (7.7) | 38 (10.8) | 136 (14.9) | 432 (13.7) | 606 (13.7) |
| >=3 | 254 (5.8) | 16 (4.6) | 136 (14.9) | 523 (16.6) | 675 (15.3) |
| **Number of outpatient visits**  |  |  |  |  |  |
| 0-10 | 2,089 (47.3) | 115 (32.8) | 171 (18.8) | 839 (26.6) | 1,125 (25.5) |
| 11-20 | 925 (21.0) | 89 (25.4) | 195 (21.4) | 672 (21.3) | 956 (21.7) |
| >=21 | 1,401 (31.7) | 147 (41.9) | 544 (59.8) | 1,643 (52.1) | 2,334 (52.9) |
| **Comorbidity**  |  |  |  |  |  |
| Hypertension | 1,203 (27.2) | 64 (18.2) | 328 (36.0) | 1,191 (37.8) | 1,583 (35.9) |
| Dyslipidemia | 624 (14.1) | 44 (12.5) | 172 (18.9) | 546 (17.3) | 762 (17.3) |
| Diabetes  | 508 (11.5) | 24 (6.8) | 137 (15.1) | 487 (15.4) | 648 (14.7) |
| Chronic liver disease  | 218 (4.9) | 28 (8.0) | 91 (10.0) | 372 (11.8) | 491 (11.1) |
| Chronic kidney disease  | 132 (3.0) | 4 (1.1) | 66 (7.3) | 303 (9.6) | 373 (8.4) |
| Chronic pulmonary disease | 255 (5.8) | 22 (6.3) | 108 (11.9) | 368 (11.7) | 498 (11.3) |
| Peptic ulcer disease | 278 (6.3) | 39 (11.1) | 165 (18.1) | 680 (21.6) | 884 (20.0) |
| Cerebrovascular disease | 236 (5.3) | 62 (17.7) | 54 (5.9) | 331 (10.5) | 447 (10.1) |
| Depression | 97 (2.2) | 22 (6.3) | 47 (5.2) | 188 (6.0) | 257 (5.8) |
| Sleep | 353 (8.0) | 39 (11.1) | 122 (13.4) | 431 (13.7) | 592 (13.4) |
| Anxiety | 108 (2.4) | 21 (6.0) | 28 (3.1) | 142 (4.5) | 191 (4.3) |
| Substance and alcohol use disorder | 12 (0.3) | 4 (1.1) | 7 (0.8) | 30 (1.0) | 41 (0.9) |

## Supplementary Table S3. Demographics, comorbidities and specialty of diagnosis in patients with different SSD and FSS after propensity score weighting

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 　 | Overall | MS | RA | IBD | Controls |
|  | 4415 | 351 | 910 | 3154 | 4415 |
| 　 | N (%) | N (%) | N (%) | N (%) | N (%) |
| **Age (years)** |  |  |  |  |  |
| 18-34 | 1,123 (25.4) | 85 (24.3) | 222 (24.4) | 816 (25.9) | 1,087 (24.6) |
| 35-44 | 930 (21.1) | 75 (21.4) | 182 (20.0) | 672 (21.3) | 952 (21.6) |
| 45-54 | 1,059 (24.0) | 79 (22.6) | 230 (25.3) | 750 (23.8) | 1,075 (24.4) |
| 55-64 | 650 (14.7) | 55 (15.7) | 140 (15.3) | 456 (14.5) | 678 (15.4) |
| >=65 | 653 (14.8) | 56 (16.1) | 136 (15.0) | 460 (14.6) | 622 (14.1) |
| **Sex**  |  |  |  |  |  |
| Female | 1,404 (31.8) | 109 (31.0) | 280 (30.8) | 1,015 (32.2) | 1,364 (30.9) |
| Male | 3,011 (68.2) | 242 (69.0) | 630 (69.2) | 2,139 (67.8) | 3,051 (69.1) |
| **Monthly Income (USD)** |  |  |  |  |  |
| <=20000 | 1,194 (27.1) | 97 (27.7) | 239 (26.3) | 858 (27.2) | 1,118 (25.3) |
| 20001-40000 | 2,277 (51.6) | 183 (52.2) | 478 (52.6) | 1,615 (51.2) | 2,374 (53.8) |
| >40001 | 944 (21.4) | 71 (20.2) | 193 (21.2) | 680 (21.6) | 922 (20.9) |
| **Charlson comorbid index** |  |  |  |  |  |
| 0 | 2,739 (62.0) | 232 (66.2) | 534 (58.6) | 1,973 (62.6) | 2,841 (64.4) |
| 1 | 954 (21.6) | 69 (19.6) | 215 (23.7) | 670 (21.2) | 920 (20.8) |
| 2 | 494 (11.2) | 35 (10.1) | 105 (11.6) | 353 (11.2) | 413 (9.4) |
| >=3 | 228 (5.2) | 15 (4.2) | 56 (6.2) | 157 (5.0) | 241 (5.5) |
| **Number of outpatient visits**  |  |  |  |  |  |
| 0-10 | 1,396 (31.6) | 116 (33.2) | 257 (28.2) | 1,023 (32.4) | 1,474 (33.4) |
| 11-20 | 1,118 (25.3) | 85 (24.2) | 235 (25.8) | 799 (25.3) | 1,058 (24.0) |
| >=21 | 1,901 (43.1) | 150 (42.7) | 418 (46.0) | 1,333 (42.3) | 1,883 (42.7) |
| **Comorbidity**  |  |  |  |  |  |
| Hypertension | 935 (21.2) | 70 (19.9) | 211 (23.2) | 654 (20.7) | 994 (22.5) |
| Dyslipidemia | 625 (14.2) | 49 (13.8) | 145 (15.9) | 432 (13.7) | 602 (13.6) |
| Diabetes  | 410 (9.3) | 34 (9.6) | 91 (10.0) | 285 (9.1) | 381 (8.6) |
| Chronic liver disease  | 358 (8.1) | 25 (7.1) | 79 (8.6) | 255 (8.1) | 359 (8.1) |
| Chronic kidney disease  | 77 (1.7) | 6 (1.7) | 13 (1.4) | 58 (1.8) | 90 (2.0) |
| Chronic pulmonary disease | 317 (7.2) | 23 (6.5) | 80 (8.8) | 214 (6.8) | 295 (6.7) |
| Peptic ulcer disease | 540 (12.2) | 42 (12.1) | 121 (13.3) | 377 (11.9) | 505 (11.4) |
| Cerebrovascular disease | 456 (10.3) | 24 (6.7)\* | 110 (12.1) | 323 (10.2) | 478 (10.8) |
| Depression | 209 (4.7) | 16 (4.5) | 36 (3.9) | 157 (5.0) | 210 (4.8) |
| Sleep | 467 (10.6) | 39 (11.1) | 101 (11.1) | 326 (10.4) | 456 (10.3) |
| Anxiety | 206 (4.7) | 15 (4.4) | 42 (4.6) | 149 (4.7) | 189 (4.3) |
| Substance and alcohol use disorder | 35 (0.8) | 2 (0.6) | 7 (0.8) | 26 (0.8) | 48 (1.1) |

\*All SMD <0.1 except the prevalence of Cerebrovascular disease between control group and patients with multiple sclerosis

|  |
| --- |
| **Supplementary Table S4. Clinical outcomes in patients with different SSD and FSS** |
| 　 | Crude HR (95% CI) | Adjusted HR (95% CI) |
| **Psychiatric hospitalization**  |  |  |
| Overall SSD and FSS | 2.00 (1.93 ,2.08) | 1.37 (1.32 ,1.42) |
| Somatic symptom disorders  | 4.68 (4.68 ,4.34) | 2.39 (2.21 ,2.58) |
| Irritable bowel syndrome | 1.91 (1.91 ,1.80) | 1.20 (1.14 ,1.27) |
| Functional dyspepsia | 1.60 (1.60 ,1.51) | 1.17 (1.11 ,1.23) |
| Fibromyalgia | 1.65 (1.65 ,1.58) | 1.24 (1.19 ,1.28) |
| Chronic fatigue syndrome | 3.51 (3.51 ,3.32) | 1.92 (1.82 ,2.03) |
| Multiple sclerosis | 1.96 (1.96 ,0.44) | 1.39 (0.26 ,7.43) |
| Rheumatoid arthritis | 1.89 (1.89 ,0.67) | 3.06 (1.31 ,7.14) |
| Inflammatory bowel disease | 4.54 (4.54 ,2.43) | 2.79 (1.46 ,5.31) |
| **All-cause hospitalization** |  |  |
| Overall SSD and FSS | 1.94 (1.93 ,1.95) | 1.43 (1.43 ,1.44) |
| Somatic symptom disorders  | 1.89 (1.89 ,1.86) | 1.20 (1.18 ,1.22) |
| Irritable bowel syndrome | 1.92 (1.92 ,1.90) | 1.30 (1.29 ,1.31) |
| Functional dyspepsia | 2.11 (2.11 ,2.09) | 1.40 (1.39 ,1.41) |
| Fibromyalgia | 1.75 (1.75 ,1.74) | 1.23 (1.22 ,1.23) |
| Chronic fatigue syndrome | 2.45 (2.45 ,2.43) | 1.45 (1.44 ,1.47) |
| Multiple sclerosis | 4.13 (4.13 ,3.42) | 4.71 (3.93 ,5.66) |
| Rheumatoid arthritis | 5.67 (5.67 ,5.00) | 5.18 (4.56 ,5.89) |
| Inflammatory bowel disease | 4.50 (4.50 ,4.07) | 3.45 (3.11 ,3.83) |
| **Suicide** |  |  |
| Overall SSD and FSS | 1.79 (1.71 ,1.87) | 1.36 (1.30 ,1.42) |
| Somatic symptom disorders  | 4.29 (4.29 ,3.90) | 2.42 (2.20 ,2.67) |
| Irritable bowel syndrome | 1.73 (1.73 ,1.60) | 1.28 (1.20 ,1.37) |
| Functional dyspepsia | 1.40 (1.40 ,1.30) | 1.18 (1.11 ,1.25) |
| Fibromyalgia | 1.69 (1.69 ,1.60) | 1.20 (1.15 ,1.26) |
| Chronic fatigue syndrome | 2.20 (2.20 ,2.03) | 1.41 (1.31 ,1.52) |
| Multiple sclerosis | - | - |
| Rheumatoid arthritis | - | - |
| Inflammatory bowel disease | - | - |
| **All-cause mortality** |  |  |
| Overall SSD and FSS | 1.46 (1.45 ,1.47) | 1.20 (1.19 ,1.21) |
| Somatic symptom disorders  | 1.57 (1.57 ,1.54) | 1.11 (1.09 ,1.14) |
| Irritable bowel syndrome | 1.26 (1.26 ,1.25) | 1.04 (1.03 ,1.05) |
| Functional dyspepsia | 1.33 (1.33 ,1.32) | 1.20 (1.19 ,1.21) |
| Fibromyalgia | 1.40 (1.40 ,1.39) | 1.05 (1.04 ,1.05) |
| Chronic fatigue syndrome | 2.27 (2.27 ,2.24) | 1.41 (1.40 ,1.43) |
| Multiple sclerosis | 0.97 (0.97 ,0.69) | 2.07 (1.52 ,2.83) |
| Rheumatoid arthritis | 2.17 (2.17 ,1.84) | 1.89 (1.52 ,2.35) |
| Inflammatory bowel disease | 2.53 (2.53 ,2.26) | 2.03 (1.75 ,2.36) |