|  |  |  |
| --- | --- | --- |
| **Variables** | **Frequencies** | **Percentage** |
| **Female students** | 354 | 100% |
| **Age** | | |
| 18 – 23 years | 232 | 65.5% |
| 24 – 29 years | 94 | 26.6% |
| 30 – 35 years | 28 | 7.9% |
| **Educational Status** | | |
| Undergraduate | 208 | 58.8% |
| Master’s | 146 | 41.2% |
| **Father’s Occupation** | | |
| Government Job | 114 | 32.2% |
| Private Job | 92 | 26% |
| Business | 148 | 41.8% |
| **Mother’s Occupation** | | |
| Government Job | 58 | 16.4% |
| Private Job | 63 | 17.8% |
| Housewife | 233 | 65.8% |
| **Family Monthly Income (BDT)** | | |
| Below 100000 | 110 | 31.1% |
| 100000 – 200000 | 150 | 42.4% |
| 200001 – 400000 | 71 | 20.1% |
| 400001 or More | 23 | 6.5% |

**Table 1**: Distribution of socio-demographic and economic variables

Out of the total of 354 female students at North South University included in our study the prevalence of digital device users was 100%. The distribution of the socio-demographic and socio-economic variables. The age of the study participants ranged from 18-35 years of which the highest percentage of respondents was from the age group of 18-23 years (65.5%). 58.8% of the participants were enrolled in the undergraduate program and the rest 41.2% were in the master’s program. Nearly half of the respondent’s father’s occupation was business (41.8%) followed by a government job (32.2%). More than half of their mothers were housewives (65.8%) and around 34% of the respondent’s mothers were working mothers. The monthly income of 42.4% of the participants was between 100000-200000 BDT and only 6.5% of the participant’s monthly income was >400000 BDT, shown in **Table 1**.

**Table 2:** Distribution of clinical variables

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | **Frequencies** | | | **Percentage** |
| **Acute Ocular Infection** | | | | |
| Yes | | 88 | 24.9% | |
| No | | 266 | 75.1% | |
| **Conjunctivitis** | | | | |
| Yes | | 142 | 40.1% | |
| No | | 212 | 59.9% | |
| **Other Eye Diseases** | | | | |
| Yes | | 32 | 9% | |
| No | | 322 | 91% | |
| **Ocular Medication Use** | | | | |
| Yes | | 173 | 48.9% | |
| No | | 181 | 51.1% | |
| **Household Member Chronic Disease** | | | | |
| Yes | | 248 | 70.1% | |
| No | | 106 | 29.9% | |
| **Who has Chronic Disease** | | | | |
| Mother | | 46 | 13% | |
| Father | | 98 | 27.7% | |
| Both | | 122 | 34.5% | |
| Don’t have | | 88 | 24.9% | |
| **Ocular treatment within last six months of respondents** | | | | |
| Yes | | 125 | 35.4% | |
| No | | 228 | 64.6% | |

The distribution of the clinical variables (Table 2). According to our study less than 50% participants had acute ocular infection than participants had no acute ocular infection (75.1%). Most of the participants in our study had not found ocular conjunctivitis (59.9%) and other eye related disease (91%). Nearly half of the participants used ocular medication (48.9%). The higher percentage of participants household member (70.1%) had chronic disease. Lower percentage (13%) of participants mother were chronic disease where maximum (34.5%) was both father and mother. Only 35.4% participants ocular treatment was continued within the last six months, shown in **Table 2**.

**Table 3:** Distribution of refractive error, family history, near work, and outdoor activities variables

|  |  |  |
| --- | --- | --- |
| **Domain-I Refractive Error** | | |
| **Wearing Glasses** | | |
| Yes | 258 | 72.9% |
| No | 96 | 27.1% |
| **Purpose of wearing glasses** | | |
| **Cosmetic Use** | | |
| Yes | 122 | 34.5% |
| No | 232 | 65.5% |
| **Refractive Error** | | |
| Yes | 173 | 48.9% |
| No | 181 | 51.1% |
| **Therapeutical** | | |
| Yes | 107 | 30.2% |
| No | 247 | 69.8% |
| **Wearing Contact Lens** | | |
| Yes | 124 | 35% |
| No | 230 | 65% |
| **Purpose of wearing contact lens** | | |
| **Cosmetic Use** | | |
| Yes | 83 | 23.4% |
| No | 271 | 76.6% |
| **Refractive Error** | | |
| Yes | 48 | 13.6% |
| No | 306 | 86.4% |
| **Therapeutical** | | |
| Yes | 21 | 5.9% |
| No | 333 | 94.1% |
| **Type of contact lens** | | |
| **Soft** | | |
| Yes | 74 | 20.9% |
| No | 280 | 79.1% |
| **RGP** | | |
| Yes | 37 | 10.5% |
| No | 317 | 89.5% |
| **Therapeutic** | | |
| Yes | 36 | 10.2% |
| No | 317 | 89.5% |
| **Domain- II Family History** | | |
| **Parental Myopia** | | |
| Yes | 212 | 59.9% |
| No | 142 | 40.1% |
| **Who has Myopia** | | |
| Father | 56 | 15.8% |
| Mother | 77 | 21.8% |
| Both | 106 | 29.9% |
| Don’t have | 115 | 32.5% |
| **Domain- III Near Work** | | |
| **Gadgets at Home** | | |
| **Computer/Laptop** | | |
| Yes | 335 | 94.6% |
| No | 19 | 5.4% |
| **Mobile** | | |
| Yes | 353 | 99.7% |
| No | 1 | 0.3% |
| **Tablet** | | |
| Yes | 148 | 41.8% |
| No | 206 | 58.2% |
| **Time Spend with Digital Device** | | |
| 1 – 3 hours | 33 | 9.3% |
| 3 – 5 hours | 141 | 39.8% |
| >5 hours | 179 | 50.6% |
| **Domain- IV Outdoor Activities** | | |
| **Outdoor Activities Weekdays** | | |
| Below 2 hours | 116 | 32.8% |
| 2 – 5 hours | 161 | 45.5% |
| 5 hours or more | 77 | 21.8% |
| **Outdoor Activities Weekend** | | |
| Below 4 hours | 177 | 50% |
| 4 – 8 hours | 125 | 35.3% |
| 8 – 12 hours | 36 | 10.2% |
| 12 hours or more | 16 | 4.5% |

The distribution of the refractive error, family ocular history, near work, and outdoor activities variables (Table 3). The prevalence of spectacles use was 72.9% among the digital device users. Nearly 50% participants used spectacles to correct the refractive error followed by the participants who used spectacles for cosmetic (34.5%) and therapeutic (30.2%) purposes. Among the total participants 35% digital device users wore contact lens. Most of the participants used contact lens for cosmetic use (23.4%) than who used for therapeutic (5.9%) purposes and soft contact lens users (20.9%) were more than RGP (10.5%) and therapeutic type lens users (10.2%), respectively. The majority percentage of respondents (59.9%) had parental myopia. 2.6% less respondents both father and mother had myopia and 32.5% of their parents had no myopia found from our study. Almost half of the respondents had spent time with digital devices more than 5 hours followed by the respondents (9.3%) whose spent 1 to 3 hours. They were spent time with computer (94.6%), mobile (99.7%), and tablet (41.8%) used at their home. Moreover, nearly half of the participants (45.5%) weekdays outdoor activity time was 2 to 5 hours than participants (21.8%) who had 5 hours or more. But in weekend 50% participants outdoor activity time was <4hours followed by the participants (4.5%) whose had >12 hours, shown in **Table 3**.

Of the two outcome variables, digital device users of female students at North South University were found a higher prevalence in myopia (57.9%). And the overall prevalence of dry eye disease was found 32.5%.

**Table 4:** Prevalence and distribution of outcome variables with socio-demographic and economic variables

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **Myopia** | | **P-value** | **Dry eye disease** | | **P-value** |
| **Yes** | **No** | No | Yes |
| **Female students** | **205 (57.91%)** | **149 (42.09%)** |  | **239 (67.5%)** | **115 (32.5%)** |  |
| **Age** | | | | | | |
| 18 – 23 years | 131 (56.5%) | 101 (43.5%) | 0.322 | 160 (69%) | 72 (31%) | 0.722 |
| 24 – 29 years | 60 (63.8%) | 34 (36.2%) | 61 (64.9%) | 33 (35.1%) |
| 30 – 35 years | 14 (50%) | 14 (50%) | 18 (64.3%) | 10 (35.7%) |
| **Educational Status** | | | | | | |
| Undergraduate | 115 (55.3%) | 93 (44.7%) | 0.279 | 147 (70.7%) | 61 (29.3%) | 0.162 |
| Master’s | 90 (61.6%) | 56 (38.4%) | 92 (63%) | 54 (37%) |
| **Father’s Occupation** | | | | | | |
| Government Job | 67 (58.8%) | 47 (41.2%) | 0.933 | 75 (65.8%) | 39 (34.2%) | 0.743 |
| Private Job | 54 (58.7%) | 38 (41.3%) | 65 (70.7%) | 27 (29.3%) |
| Business | 84 (56.8%) | 64 (43.2%) | 99 (66.9%) | 49 (33.1%) |
| **Mother’s Occupation** | | | | | | |
| Government Job | 38 (65.5%) | 20 (34.5%) | 0.342 | 36 (62.1%) | 22 (37.9%) | 0.437 |
| Private Job | 38 (60.3%) | 25 (39.7%) | 46 (73%) | 17 (27%) |
| Housewife | 104 (44.6%) | 104 (44.6%) | 157 (67.4%) | 76 (32.6%) |
| **Family Monthly Income (BDT)** | | | | | | |
| Below 100000 | 54 (49.1%) | 56 (50.9%) | **<0.009** | 82 (74.5%) | 28 (25.5%) | 0.072 |
| 100000 – 200000 | 93 (62%) | 57 (38%) | 100 (66.7%) | 50 (33.3%) |
| 200001 – 400000 | 49 (69%) | 22 (31%) | 40 (56.3%) | 31 (43.7%) |
| 400001 or More | 9 (39.1%) | 14 (60.9%) | 17 (73.9%) | 6 (26.1%) |

Female students aged 24 – 29 years were found higher myopic students (63.8%) compared to the other 2 age groups whereas students aged 18 – 23 years had slightly higher percentage of myopia (56.5%). Dry eye disease was found to be the highest age group 30 – 35 years (35.7%) compared to the other aged group. With the increase in the level of educational attainment myopia and DED was found to have increased. Around 55.3%, and 29.3% undergraduate students had myopia and DED compared to the higher educated students whose percentage was 61.6% and 37%. A higher percentage of myopia and DED were found to be the students whose father did government job and its percentage was 58.8% and 34.2% compared to whose father did business (56.8%) and private job (29.3). A similar pattern was found in the mother’s occupation. Myopia and DED found to be higher whose mother did government job (65.5% and 37.9%) compared to whose mother did business (44.6%%) and private job (27%). The percentage of two outcome variable was found among the students whose family monthly income between 200001 BDT and 400000 BDT. And the percentage was 69% and 43.7%. Similarly, lower percentage of myopia (39.1%) and DED (25.5%) found to be ‘400001 BDT or More’ income group and ‘Below 100000 BDT’ income group, shown in **Table 4**.

**Table 5:** Prevalence and distribution of outcome variables with clinical variables

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **Myopia** | | **P-value** | **Dry eye disease** | | **P-value** |
| **Yes** | **No** | No | Yes |
| **Acute Ocular Infection** | | | | | | |
| Yes | 71 (80.7%) | 17 (19.3%) | **<0.000** | 46 (52.3%) | 42 (47.7%) | **<0.001** |
| No | 134 (50.4%) | 132 (49.6%) | 193 (72.6%) | 73 (27.4%) |
| **Conjunctivitis** | | | | | | |
| Yes | 88 (62%) | 54 (38%) | 0.247 | 81 (57%) | 61 (43%) | **<0.001** |
| No | 117 (55.2%) | 95 (44.8%) | 158 (74.5%) | 54 (25.5%) |
| **Other Eye Diseases** | | | | | | |
| Yes | 20 (62.5%) | 12 (37.5%) | 0.716 | 18 (56.2%) | 14 (43.8%) | 0.219 |
| No | 185 (57.5%) | 137 (42.5%) | 221 (68.6%) | 101 (31.4%) |
| **Ocular Medication Use** | | | |  |  |
| Yes | 107 (61.8%) | 66 (38.2%) | 0.174 | 101 (58.4%) | 72 (41.6%) | **<0.001** |
| No | 98 (54.1%) | 83 (45.9%) | 138 (76.2%) | 43 (23.8%) |
| **Household Member Chronic Disease** | | | | | | |
| Yes | 148 (59.7%) | 100 (40.3%) | 0.361 | 159 (64.1%) | 89 (35.9%) | **<0.049** |
| No | 57 (53.8%) | 49 (46.2%) | 80 (75.5%) | 26 (24.5%) |
| **Who has Chronic Disease** | | | | | | |
| Mother | 20 (43.5%) | 26 (56.5%) | **<0.009** | 41 (89.1%) | 5 (10.9%) | **<0.000** |
| Father | 58 (59.2%) | 40 (40.8%) | 67 (68.4%) | 31 (31.6%) |
| Both | 83 (68%) | 39 (32%) | 63 (51.6%) | 59 (48.4%) |
| Don’t have | 44 (50%) | 44 (50%) | 68 (77.3%) | 20 (22.7%) |
| **Ocular treatment within last six months of respondents** | | | | | | |
| Yes | 95 (76%) | 30 (24%) | **<0.000** | 65 (51.6%) | 61 (48.4%) | **<0.000** |
| No | 110 (48.2%) | 118 (51.8%) | 174 (76.3%) | 54 (23.7%) |

80.7% and 47.7% of the female students whose had acute ocular infection had higher probability of myopia and DED compared to students with no acute ocular infection (50.4% and 27.4%). Similarly, students who had myopia the prevalence of conjunctivitis and other ocular diseases was 62% and 62.5% compared to who had no exposure of conjunctivitis (55.2%) and other ocular diseases (57.5%). Among the DED students the prevalence of conjunctivitis and other ocular diseases were found 43% and 43.8% compared to who had no conjunctivitis (25.5%) and other ocular diseases (31.4%), respectively. Female students to use ocular medication had found higher prevalence of myopia and DED with a prevalence of 61.8% and 41.6% respectively compared to other counterparts with no use of ocular medication. Around 59.7% and 35.9% female students were myopia and DED whose household members had chronic disease compared to whose household members had no chronic disease and its percentage was 53.8% and 24.5%. A higher percentage of myopia and DED found to be the students whose father and mother both had the chronic disease and these percentage were 68% and 48.4% compared to whose parents had no chronic diseases. Among the female students whose mother had chronic disease found lower prevalence of myopia and DED with prevalence of 43.5% and 10.9%. Continuation of ocular treatment within last six months was given the higher prevalence of myopia and DED among the female students with percentage of 76% and 48.4%. And lower prevalence of myopia and DED found to be who had no ocular treatment within last six months with prevalence of 48.2% and 23.7%, shown in **Table 5**.

**Table 6:** Prevalence and distribution of outcome variables with refractive error, family ocular history, near work, and outdoor activities variables

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **Myopia** | | **P-value** | **Dry eye disease** | | **P-value** |
| **Yes** | **No** | No | Yes |
| **Domain-I Refractive Error** | | | | | | |
| **Wearing Glasses** | | | | | | |
| Yes | 202 (78.3%) | 56 (21.7%) | **<0.000** | 159 (61.6%) | 99 (38.4%) | **<0.000** |
| No | 3 (3.1%) | 93 (96.9%) | 80 (83.3%) | 16 (16.7%) |
| **Purpose of wearing glasses** | | | | | | |
| **Cosmetic Use** | | | | | | |
| Yes | 91 (74.6%) | 31 (25.4%) | **<0.000** | 83 (68%) | 39 (32%) | 0.975 |
| No | 114 (49.1%) | 118 (50.9%) | 156 (67.2%) | 76 (32.8%) |
| **Refractive Error** | | | | | | |
| Yes | 145 (83.8%) | 28 (16.2%) | **<0.000** | 102 (59%) | 71 (41%) | **<0.001** |
| No | 60 (33.1%) | 121 (66.9%) | 137 (75.7%) | 44 (24.3%) |
| **Therapeutical** | | | | | | |
| Yes | 99 (92.5%) | 8 (7.5%) | **<0.000** | 55 (51.4%) | 52 (48.6%) | **<0.000** |
| No | 106 (42.9%) | 141 (57.1%) | 184 (74.5%) | 63 (25.5%) |
| **Wearing Contact Lens** | | | | | | |
| Yes | 96 (77.4%) | 28 (22.6%) | **<0.000** | 72 (58.1%) | 52 (41.9%) | **<0.008** |
| No | 109 (47.4%) | 121 (52.6%) | 167 (72.6%) | 63 (27.4%) |
| **Purpose of wearing contact lens** | | | | | | |
| **Cosmetic Use** | | | | | | |
| Yes | 65 (78.3%) | 18 (21.7%) | **<0.000** | 50 (60.2%) | 33 (39.8%) | 0.138 |
| No | 140 (51.7%) | 131 (48.3%) | 189 (69.7%) | 82 (30.3%) |
| **Refractive Error** | | | | | | |
| Yes | 37 (77.1%) | 11 (22.9%) | **<0.006** | 26 (54.2%) | 22 (45.8%) | 0.050 |
| No | 168 (54.9%) | 138 (45.1%) | 213 (69.6%) | 93 (30.4%) |
| **Therapeutical** | | | | | | |
| Yes | 18 (85.7%) | 3 (14.3%) | **<0.015** | 11 (52.4%) | 10 (47.6%) | 0.198 |
| No | 187 (56.2%) | 146 (43.8%) | 228 (68.5%) | 105 (31.5%) |
| **Type of contact lens** | | | | | | |
| **Soft** | | | | | | |
| Yes | 53 (71.6%) | 21 (28.4%) | **<0.011** | 45 (60.8%) | 29 (39.2%) | 0.213 |
| No | 152 (54.3%) | 128 (45.7%) | 194 (69.3%) | 86 (30.7%) |
| **RGP** | | | | | | |
| Yes | 30 (81.1%) | 7 (18.9%) | **<0.004** | 24 (64.9%) | 13 (35.1%) | 0.859 |
| No | 175 (55.2%) | 142 (44.8%) | 215 (67.8%) | 102 (32.2%) |
| **Therapeutic** | | | | | | |
| Yes | 33 (91.7%) | 3 (8.3%) | **<0.000** | 18 (50%) | 18 (50%) | **<0.029** |
| No | 171 (53.9%) | 146 (46.1%) | 221 (69.5%) | 97 (30.5%) |
| **Domain- II Family History** | | | | | | |
| **Parental Myopia** | | | | | | |
| Yes | 121 (57.1%) | 91 (42.9%) | 0.781 | 144 (67.9%) | 68 (32.1%) | 0.932 |
| No | 84 (59.2%) | 58 (40.8%) | 95 (66.9%) | 47 (33.1%) |
| **Who has Myopia** | | | | | | |
| Father | 28 (50%) | 28 (50%) | 0.157 | 45 (80.4%) | 11 (19.6%) | **<0.045** |
| Mother | 39 (50.6%) | 38 (49.4%) | 50 (64.9%) | 27 (35.1%) |
| Both | 68 (64.2%) | 38 (35.8%) | 63 (59.4%) | 43 (40.6%) |
| Don’t have | 70 (60.9%) | 45 (39.1%) | 81 (70.4%) | 34 (29.6%) |
| **Domain- III Near Work** | | | | | | |
| **Gadgets at Home** | | | | | | |
| **Computer/Laptop** | | | | | | |
| Yes | 195 (58.2%) | 140 (41.8%) | 0.810 | 224 (66.9%) | 111 (33.1%) | 0.399 |
| No | 10 (52.6%) | 9 (47.4%) | 15 (78.9%) | 4 (21.1%) |
| **Mobile** | | | | | | |
| Yes | 204 (57.8%) | 149 (42.2%) | 1.000 | 238 (67.4%) | 115 (32.6%) | 1.000 |
| No | 1 (100%) | 0 (0.0%) | 1 (100%) | 0 (0.0%) |
| **Tablet** | | | | | | |
| Yes | 93 (62.8%) | 55 (37.2%) | 0.138 | 87 (58.8%) | 61 (41.2%) | **<0.004** |
| No | 112 (54.4%) | 94 (45.6%) | 152 (73.8%) | 54 (26.2%) |
| **Time Spend with Digital Device** | | | | | | |
| 1 – 3 hours | 9 (27.3%) | 24 (72.7%) | **<0.002** | 28 (84.8%) | 5 (15.2%) | **<0.007** |
| 3 – 5 hours | 86 (61%) | 55 (39%) | 102 (72.3%) | 39 (27.7%) |
| >5 hours | 109 (60.9%) | 70 (39.1%) | 109 (60.6%) | 71 (39.4%) |
| **Domain- IV Outdoor Activities** | | | | | | |
| **Outdoor Activities Weekdays** | | | | | | |
| Below 2 hours | 65 (56%) | 51 (44%) | 0.293 | 84 (72.4%) | 32 (27.6%) | 0.389 |
| 2 – 5 hours | 100 (62.1%) | 61 (37.9%) | 105 (65.2%) | 56 (34.8%) |
| 5 hours or more | 40 (51.9%) | 37 (48.1%) | 50 (64.9%) | 27 (35.1%) |
| **Outdoor Activities Weekend** | | | | | | |
| Below 4 hours | 106 (59.9%) | 71 (40.1%) | 0.603 | 120 (67.8%) | 57 (32.2%) | 0.412 |
| 4 – 8 hours | 68 (54.4%) | 57 (45.6%) | 82 (65.6%) | 43 (34.4%) |
| 8 – 12 hours | 23 (63.9%) | 13 (36.1%) | 28 (77.8%) | 8 (22.2%) |
| 12 hours or more | 8 (50%) | 8 (50%) | 9 (56.2%) | 7 (43.8%) |

Prevalence of myopia and DED among the students who wore glasses were 78.3% and 38.4%. Maximum prevalence found from who had myopia and similarly, lower prevalence found 3.1% and 16.7%. A higher percentage of students who had myopia used glasses for cosmetic, correcting the refractive error, and therapeutic purposes compared to who had not used glasses these purposes, respective percentage was 74.6%, 83.8%, and 92.5%. DED also followed the similar pattern. Students who had DED used glasses for cosmetic, correcting refractive error, and therapeutic purposes were higher compared to who had not used glasses these purposes and this percentage was 32%, 41%, and 48.6%.

Prevalence of wearing contact lens among the students who had myopia and DED was 77.4% and 41.9%. Most of the contact lens users who had myopia used lens for cosmetic, correcting refractive, and therapeutic purposes were higher than who were not used glasses for these purposes and percentage was 78.3%, 77.1, and 85.7%. The percentage of users who had no DED but used contact lens for cosmetic, refractive error, and therapeutic purposes were higher than who had DED and respective percentage was 60.2%, 54.2%, and 52.4%. 71.6%, 81.1%, and 91.7% contact lens users who had myopia their lens type was soft, RGP, and therapeutic compared to whose contact lens type were not. DED exposed students whose contact lens type were like myopia exposed students they were less prevalent. Similarly, 39.2%, 35.1%, and 50% students who had DED and their lens type was soft, RGP, and therapeutic found to be higher than whose lens types were not soft (30.7%), RGP (32.2%), and therapeutic (30.5%).

According to our study family ocular history had no longer association with myopia and DED. A lower percentage of myopia (57.1%) and DED (32.1%) exposed students had parental myopia compared to myopia (59.2%) and DED (33.1%) exposed students whose had no parental myopia in their ocular history. 64.2% of the female students whose had exposed to myopia were found to have their both father and mother had myopia compared to whose parents had no myopia (60.9%). Similarly, DED found to be higher with both father and mother (40.6%) were myopia compared to whose parents had no myopia (29.6%).

The percentage of all outcome variables increased with the increase of duration of time spend with digital device. The percentage among lowest group ‘1 – 3 hours’ was 27.3% and 15.2% for the female students who had myopia and DED. Highest percentage of myopia were found ‘3 – 5 hours’ (61%) and ‘>5 hours’ (60.9%) group and DED found to be ‘>5 hours’ group and this percentage was 39.4%. And significant percentage of students had computer (58.2%), mobile (57.8%), and tablet (62.8%) whose were myopia compared to who had not computer/laptop, mobile, and tablet. On the other hand, students whose were DED among them 33.1%, 32.6%, and 41.2% had computer/laptop, mobile, and tablet to spend their time compared to who had not any digital devices.

Outdoor activities in weekdays and weekend were more important for preventing myopia and DED. From our study we found that, students who had myopia their weekdays activities were 3 to 5 hours and this percentage 62.1% compared to other two groups ‘Below 2 hours’ and ‘>5 hours’, percentage of this group was 56% and 51.9%. Besides, 34.8% students who had DED they had spent more than 5 hours for outdoor activities in weekdays compared to other two groups where 27.6% and 34.8% found to be ‘Below 2 hours’ and ‘2 – 5 hours’ groups. In weekend, maximum percentage of myopia exposed students (63.9%) average outdoor activities duration was 8 to 12 hours compared to other three groups where the percentage of ‘Below 4 hours’ groups (59.9%) slightly higher than remaining two groups ‘4 – 8 hours’ (54.4%) and ’12 hours or more’ (50%). Similarly, DED exposed students who had spent more time for outdoor activities were found to be 43.8% compared to other counterparts with lower time to spend for outdoor activities in weekend, shown in **Table 6**.

**Table 7** shows the binary logistic regression analysis result where our outcome variable was myopia and significant independent variables were found from bivariate analysis. After analysis we found wearing glasses for refractive error, purpose for wearing glasses, and time spend with digital device were more significant for digital device users to develop myopia disease.

**Table 7:** Factors associated with myopia.

|  |  |  |
| --- | --- | --- |
| **Variables** | **Myopia vs Digital Device Users** | |
| **AOR** | **95% CI** |
| **Socio Demographic & Economic** | | |
| **Family Monthly Income (BDT)** | | |
| Below 100000 (RC) | 1 |  |
| 100000 – 200000 | 0.797 | 0.347 – 1.826 |
| 200001 – 400000 | 0.639 | 0.214 – 1.821 |
| 400001 or More | 3.015 | 0.662 – 13.663 |
| **Clinical Treatment Information** | | |
| **Acute Ocular Infection** | | |
| Yes | 0.687 | 0.258 – 1.763 |
| No (RC) | 1 |  |
| **Who has Chronic Disease** | | |
| Mother | 1.034 | 0.329 – 3.201 |
| Father | 1.538 | 0.592 – 4.073 |
| Both | 0.861 | 0.303 – 2.429 |
| Don’t have (RC) | 1 |  |
| **Ocular treatment within last six months of respondents** | | |
| Yes | 0.864 | 0.384 – 1.916 |
| No (RC) | 1 |  |
| **Domain-I Refractive Error** | | |
| **Wearing Glasses** | | |
| Yes | **0.046\*\*\*** | **0.008 – 0.204** |
| No (RC) | 1 |  |
| **Purpose of wearing glasses** | | |
| **Cosmetic Use** | | |
| Yes | 1.112 | 0.429 – 2.768 |
| No (RC) | 1 |  |
| **Refractive Error** | | |
| Yes | **0.179\*\*\*** | **0.065 – 0.452** |
| No (RC) | 1 |  |
| **Therapeutical** | | |
| Yes | **0.091\*\*\*** | **0.029 – 0.242** |
| No (RC) | 1 |  |
| **Wearing Contact Lens** | | |
| Yes | 0.594 | 0.081 – 4.405 |
| No (RC) | 1 |  |
| **Purpose of wearing contact lens** | | |
| **Cosmetic Use** | | |
| Yes | 0.302 | 0.033 – 2.407 |
| No (RC) | 1 |  |
| **Refractive Error** | | |
| Yes | 0.625 | 0.075 – 4.549 |
| No (RC) | 1 |  |
| **Therapeutical** | | |
| Yes | 0.353 | 0.031 – 3.306 |
| No (RC) | 1 |  |
| **Type of Contact Lens** | | |
| **Soft** | | |
| Yes | 3.070 | 0.403 – 19.961 |
| No (RC) | 1 |  |
| **RGP** | | |
| Yes | 0.884 | 0.092 – 7.229 |
| No (RC) | 1 |  |
| **Therapeutic** | | |
| Yes | 1.799 | 0.181 – 12.508 |
| No (RC) | 1 |  |
| **Domain- III Near Work** | | |
| **Time Spend with Digital Device** | | |
| 1 – 3 hours (RC) | 1 |  |
| 3 – 5 hours | **0.188\*\*** | **0.052 – 0.636** |
| >5 hours | **0.240\*** | **0.071 – 0.772** |
| **Dry Eye Disease (DED) for Myopia** | | |
| **Dry Eye Disease** | | |
| No (RC) | 1 |  |
| Yes | 0.552 | 0.229 – 1.279 |
| *\*p<0.05, \*\*p<0.01, \*\*\*p<0.001*  **AOR:** Adjusted Odds Ratio; **CI:** Confidence Interval; **RC:** Reference Category | | |

According to result shows in **Table 7**, we found that participants who wore glass (AOR: 0.046, 95% CI: 0.008 – 0.204) were 95.4% lower likelihood to myopia disease compared to who did not wear glass. Myopia disease was 82.1% lower for participants who used glass to correct the refractive error (AOR: 0.179, 95% CI: 0.065 – 0.452) compared to who did not. Similarly, participants who therapeutically used the glass (AOR: 0.091, 95% CI: 0.029 – 0.242) were 0.091 times lower chance to develop myopia compared to who used glass in other purposes. Moreover, myopia disease was higher among the participants whose daily digital device spent time were 3 to 5 hours (AOR: 0.188, 95% CI: 0.052 – 0.636) and more than 5 hours (AOR: 0.240, 95% CI: 0.071 – 0.772) compared to those who were spent time 1 to 3 hours, shown in **Table 7**.

**Table 8** shows the binary logistic regression analysis result for dry eye disease (DED) and only significant variable was myopia.

**Table 8:** Factors associated with dry eye disease.

|  |  |  |
| --- | --- | --- |
| **Variables** | **Dry Eye Disease vs Digital Device Users** | |
| **AOR** | **95% CI** |
| **Clinical Treatment Information** | | |
| **Acute Ocular Infection** | | |
| Yes | 0.988 | 0.488 – 1.978 |
| No (RC) | 1 |  |
| **Conjunctivitis** | | |
| Yes | 1.701 | 0.903 – 3.205 |
| No (RC) | 1 |  |
| **Ocular Medication Use** | | |
| Yes | 1.183 | 0.563 – 2.464 |
| No (RC) | 1 |  |
| **Household Member Chronic Disease** | | |
| Yes | 1.496 | 0.449 – 5.424 |
| No (RC) |  |  |
| **Who has Chronic Disease** | | |
| Mother | 0.192 | 0.033 – 0.992 |
| Father | 0.697 | 0.182 – 2.444 |
| Both | 1.133 | 0.249 – 4.794 |
| Don’t have (RC) | 1 |  |
| **Ocular treatment within last six months of respondents** | | |
| Yes | 1.556 | 0.786 – 3.085 |
| No (RC) | 1 |  |
| **Domain-I Refractive Error** | | |
| **Wearing Glasses** | | |
| Yes | 0.645 | 0.230 – 1.741 |
| No (RC) | 1 |  |
| **Purpose of wearing glasses** | | |
| **Refractive Error** | | |
| Yes | 1.412 | 0.742 – 2.710 |
| No (RC) | 1 |  |
| **Therapeutical** | | |
| Yes | 1.444 | 0.725 – 2.877 |
| No (RC) | 1 |  |
| **Wearing Contact Lens** | | |
| Yes | 1.139 | 0.575 – 2.240 |
| No (RC) | 1 |  |
| **Type of contact lens** | | |
| **Therapeutic** | | |
| Yes | 1.387 | 0.543 – 3.553 |
| No (RC) | 1 |  |
| **Domain- II Family History** | | |
| **Who has Myopia** | | |
| Father | 0.542 | 0.221 – 1.262 |
| Mother | 1.198 | 0.573 – 2.496 |
| Both | 0.918 | 0.462 – 1.807 |
| Don’t have (RC) | 1 |  |
| **Domain- III Near Work** | | |
| **Gadgets at Home** | | |
| **Tablet** | | |
| Yes | 1.388 | 0.814 – 2.362 |
| No (RC) | 1 |  |
| **Time Spend with Digital Device** | | |
| 1 – 3 hours (RC) | 1.373 | 0.467 – 4.687 |
| 3 – 5 hours | 2.612 | 0.908 – 8.826 |
| >5 hours | 1 |  |
| **Myopia and Dry Eye Disease (DED)** | | |
| **Myopia** | | |
| Yes | **2.525\*** | **1.113 – 5.992** |
| No (RC) | 1 |  |
| *\*p<0.05, \*\*p<0.01, \*\*\*p<0.001*  **AOR:** Adjusted Odds Ratio; **CI:** Confidence Interval; **RC:** Reference Category | | |

According to result we determined that, participants whose had myopia disease (AOR: 2.525, 95% CI: 1.113 – 5.992) were 2.525 times likely to be dry eye disease compared to participants who had no myopia **(Table 8).**