The prevalence of convergence insufficiency in Iran: a population-based study

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Submitted: 16 July 2016
Revised: 21 November 2016
Accepted for publication: 8 December 2016

Purpose: The aim was to determine the prevalence of convergence insufficiency and its relationship with age, gender and refractive error in a population-based study.

Methods: In this cross-sectional study, all residents over one year old in Mashhad city, in the north east of Iran, were sampled through random stratified cluster sampling. After selecting samples and their participation in the study, they all had eye examinations including the measurement of visual acuity, refraction, binocular vision assessment, including cover test, measurement of near point of convergence and fusional vergences and finally, slitlamp biomicroscopy.

Results: Of the 4,453 selected people, 3,132 participated in the study and finally, analyses were done with data from 2,219 individuals. The mean age of the participants was 30.5 ± 14.0 years (range: 10 to 69). The prevalence of convergence insufficiency in this study was 5.51 per cent (range: 4.51 to 6.52); 4.78 per cent (range: 3.11 to 6.45) in males and 5.86 per cent (range: 4.60 to 7.11) in females (p = 0.276). Convergence insufficiency prevalence in different age groups showed no significant linear trend; however, a significant increase was observed after the age of 60 years. The prevalence of myopia, emmetropia and hyperopia was respectively 12.1, 56.9 and 31 per cent in participants with convergence insufficiency and 15.9, 54.4 and 29.6 per cent in those without convergence insufficiency (p = 0.537). Multiple logistic regression models revealed no significant relationship between the prevalence of convergence insufficiency and age, gender or refractive errors.

Conclusion: This study showed that the overall prevalence of convergence insufficiency in the Iranian population was 5.46 per cent, which is lower than that in the majority of previous studies. Convergence insufficiency prevalence had no significant change with age up to the age of 60 years but increased significantly after 60 years.

Key words: age, convergence insufficiency, gender, refractive errors, population-based, prevalence

Convergence insufficiency is a common disorder of binocular vision characterised by exophoria that is greater at near than at distance, a remote near point of convergence (NPC) and reduced positive fusional vergence at near (PFV).1,2 This disorder is often associated with multiple symptoms, such as eyestrain, headaches, blurred vision, diplopia, sleepiness, poor concentration and cognitive decline shortly after beginning to read or performing other near visual activities3,4 and this can affect the person’s quality of life and lead to decreased academic, occupational and sports performance.5–7 The association between convergence insufficiency and attention deficit hyperactivity disorder has been documented in children.8,9 Therefore, diagnosis and treatment of convergence insufficiency is an important issue in the field of binocular vision. Although convergence insufficiency is often mentioned as a common disorder of binocular vision, the prevalence of this disorder in the general population is unknown due to the lack of population-based studies.10,11 From a clinical point of view, having information about the prevalence of a condition is necessary to achieve a clinical hypothesis about the possible diagnosis and decision making around the process to be followed. Epidemiological data also have importance from other aspects, such as organising vision screening programs to detect the disorder, research projects concerning the disorder and political visual health-care strategies.11 It should be noted that several studies have been conducted on the prevalence of convergence insufficiency but all these studies are non-population-based and have generally examined samples of limited age ranges and they mainly have small samples. Furthermore, prevalence rates reported in these studies vary greatly from 2.25 to 33 per cent.6,12–22 As the target populations in previous studies are mostly children and young people, there is little information about the prevalence of convergence insufficiency in different age groups, especially after presbyopia and hence, the relationship between convergence insufficiency and age is unknown. Previous studies have pointed to an age-related increase
in near exophoria, but there is no clear evidence showing an increase in the prevalence of convergence insufficiency with age. Knowledge of the relationship between convergence insufficiency and age can provide practitioners with a better perspective about the diagnosis of this anomaly at different ages and hence, help enrich clinical practice. Given the limitations stated about the literature, the relationship of convergence insufficiency with gender and refractive errors are also unknown. Although certain sources and studies have reported no significant correlation between convergence insufficiency and refractive errors, the number of studies on this topic is small. On the other hand, exploring this relationship requires a substantial sample, which was lacking in these studies. Given the importance of correcting refractive errors in the treatment of patients with convergence insufficiency and important considerations in relation to the prescription depending on the type and amount of refractive error, it seems important to examine this relationship. The above-mentioned limitations prompted this study, which aimed to assess the prevalence of convergence insufficiency and its relation with age, gender and refractive errors in a population-based study with a large sample and a wide age range.

**METHODS**

The present cross-sectional study is part of the Mashhad Eye Study (MES), which was conducted on the urban population of Mashhad, the capital of Khorasan Razavi Province in Iran, as the second most populous city in Iran. The MES is a multi-purpose study designed to investigate different aspects of refractive, accommodative/binocular and ocular health status in a large sample of an Iranian population with a wide age range. The target population of MES was all residents of Mashhad over one year old. In this study, sampling was done through a stratified cluster approach and the samples were selected in proportion to the population of each district in Mashhad (municipality district as stratum). The number of clusters selected in each district was proportionate to the number of households in that district. A total of 120 clusters were randomly selected from the blocks defined by the Statistical Center of Khorasan Razavi Province and the first house number in each cluster was considered the head. In each cluster, sampling was continued systematically up to 10 households. Interviewers first introduced themselves, explained the importance of the project to the households, completed a demographic questionnaire and then invited them for full vision and ophthalmic examinations at the Optometry Clinic of Mashhad University of Medical Sciences. This process was repeated for 10 households in each cluster. In case of no response or refusal to participate, the adjacent household was approached. The same systematic method was continued counterclockwise until 10 neighbouring households were invited into the study. Transportation expenses for all participants were covered by the project. Once the selected households presented to the study clinic, a signed consent form was obtained from the head of the household, if they were willing to participate in the study. The consent includes commitments to keep household information confidential and take responsibility for any complications that might occur as a result of the study. The Ethics Committee of Mashhad University of Medical Sciences approved the study protocol, which was conducted in accordance with the tenets of the Helsinki Declaration. All participants signed a written informed consent form. In the initial interview, the participants were asked about their demographics as well as history of eye examinations, ocular and systemic disease, trauma to the eye, eye surgery and use of ocular or systemic medication.

**Examinations**

Examinations included vision and ophthalmic examinations. For all participants, first the uncorrected vision was measured using a Snellen E chart at six metres, then objective refraction was determined using the Topcon auto-refractometer (Topcon KR-8000, Paramus, New Jersey, USA), results of which were refined with the Beta Heine retinoscope (HEINE Optotechnik, Herrsching, Germany) and finally, the best near and far optical corrections were determined through subjective refraction and near and far visual acuities were recorded. Next, tests of binocular vision were done which included the cover test and measurement of NPC and near and distance fusional vergences with best optical correction. Near tests (including near cover test, NPC and measurement of near fusional vergences) for presbyopic individuals were performed with proper addition lenses determined by near subjective refraction. Near and distance heterophorias were measured with the alternate cover test using a prism bar at a distance of 40 centimetres and six metres, respectively. The target used in the cover test was a single character one line above the visual acuity on the near and distance Snellen charts. All NPC measurements were completed by two experienced optometrists. The first optometrist was in charge of target handling and the second was in charge of reading the NPC distance on the ruler. NPC was measured using a 6/12 single target on the Gulden fixation stick placed along the subject’s midline which was moved toward the examinee at a constant recommended rate of 1.0 cm per second. During this time, subjects were asked to try to keep the target single, until they reported experiencing diplopia or the examiner objectively observed a loss of binocularity. At this point, the distance from the spectacle plane or the lateral canthus was measured with a 50 centimetres ruler. To control the speed at which the target was moved by the first optometrist, the second optometrist held the centimeter ruler in its proper position from the beginning of the test, such that the ruler’s zero was in the spectacle plane (if any) or the lateral canthus. Therefore, the first optometrist who was responsible for handling the target was assured that the distance was accurately checked. To increase the sensitivity of the test, NPC measurements were repeated five times as explained above and the average of five measurements was recorded for each patient. PFV and negative fusional vergence (NFV) were measured with base-out and base-in prisms, respectively, using the step method at far (six metres) and near (40 centimetres) distances. For the step method, the prism bar was placed in front of the right eye, while wearing the best correction. The target used for this test was a column of 6/12 letters on the distance Snellen chart for distance tests and a column of 6/12 letters on the near Snellen chart for near tests. Subjects were asked to keep the target single, while the prism bar was moved in front of their eyes and report when they experience sustained blur or diplopia. The amount of prism was increased at a constant rate of two prism
Definitions

Convergence insufficiency was defined based on four diagnostic criteria:
1. NPC greater than or equal to six centimetres
2. Exophoria or at least four prism dioptries greater than distance exophoria
3. NFV less than twice the amount of near exophoria (failed Sheard’s criterion) or minimum normative PFV up to 4/15/12 for blur/break/recov ery (at least one of the three) and
4. Normal accommodative amplitude for age based on Hofstetter’s formula for minimum amplitude of accommodation (accommodation amplitude greater than 15 – 0.25age).

Definitions of refractive errors were based on spherical equivalent. Myopia was defined as a spherical equivalent of -0.5 or less and hyperopia was defined as a spherical equivalent of +0.5 or more.

Exclusion criteria

Due to the likelihood of inaccurate data as well as significant data missing (due to non-co-operation) in participants under 10 years of age, this age group was excluded from the analysis. Other exclusion criteria included near or distance visual acuity less than 6/7.5 in either eye, strabismus, history of eye surgery, ocular or systemic disease affecting accommodation and binocular vision, and use of ocular or systemic drugs affecting accommodation and binocular vision.

Statistical analysis

The prevalence of convergence insufficiency was summarised as percentage with 95 per cent confidence intervals in the total sample and in different age groups of 10 to 19, 20 to 29, 30 to 39, 40 to 49, 50 to 59 and 60 to 69 years old. The effect of cluster sampling was taken into account in calculating standard errors. Simple and multiple logistic regression models were used to explore statistical relationships.

Ethical issues

The Ethics Committee of Mashhad University of Medical Sciences approved the study protocol, which was conducted in accord with the tenets of the Helsinki Declaration. All participants signed a written informed consent form.

RESULTS

In this study, 3,132 of the 4,453 invitees participated in the study (response rate of 70.4 per cent).

Table 1 shows the age distribution of the population of Mashhad and our samples.

As can be seen, there is much similarity between the age distribution of our samples and the population of Mashhad; however, regarding gender, women participated more in the study than men.

After applying the exclusion criteria, 1,003 people were excluded from the database and finally, analyses were done with data from 2,219 individuals. The mean age of the participants was 30.5 ± 14.0 years (range 10 to 69 years) and 1,514 (68.2 per cent) were female.

The overall prevalence of convergence insufficiency in this study was 5.51 per cent (range 4.51 to 6.52). Convergence insufficiency prevalence in males and females were respectively 4.78 per cent (range 3.11 to 6.45) and 5.86 per cent (range 4.60 to 7.11); logistic regression analysis showed

<table>
<thead>
<tr>
<th>Age</th>
<th>Entire population of Mashhad in 2006</th>
<th>Participants in this study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>0–9</td>
<td>200,954</td>
<td>192,718</td>
</tr>
<tr>
<td>10–19</td>
<td>258,510</td>
<td>253,701</td>
</tr>
<tr>
<td>20–29</td>
<td>284,633</td>
<td>293,626</td>
</tr>
<tr>
<td>40–49</td>
<td>141,705</td>
<td>137,374</td>
</tr>
<tr>
<td>50–59</td>
<td>81,898</td>
<td>79,164</td>
</tr>
<tr>
<td>60–69</td>
<td>46,241</td>
<td>42,749</td>
</tr>
<tr>
<td>70–79</td>
<td>26,690</td>
<td>25,455</td>
</tr>
<tr>
<td>80–89</td>
<td>8,954</td>
<td>8,534</td>
</tr>
<tr>
<td>Above 90</td>
<td>902</td>
<td>1,110</td>
</tr>
<tr>
<td>Total</td>
<td>1,236,170</td>
<td>1,215,542</td>
</tr>
</tbody>
</table>

Table 1. Age and sex distribution of the population of Mashhad and participants in the study.
Table 2. Prevalence of convergence insufficiency in this study by age and gender

<table>
<thead>
<tr>
<th>Age</th>
<th>Gender</th>
<th>No (%)</th>
<th>Yes (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–19</td>
<td>Male</td>
<td>635</td>
<td>5.79</td>
<td>(3.73–7.85)</td>
</tr>
<tr>
<td>20–29</td>
<td>Male</td>
<td>481</td>
<td>7.64</td>
<td>(5.26–10.01)</td>
</tr>
<tr>
<td>30–39</td>
<td>Male</td>
<td>429</td>
<td>4.42</td>
<td>(2.47–6.36)</td>
</tr>
<tr>
<td>40–49</td>
<td>Male</td>
<td>410</td>
<td>4.62</td>
<td>(2.47–6.77)</td>
</tr>
<tr>
<td>50–59</td>
<td>Male</td>
<td>213</td>
<td>3.21</td>
<td>(0.66–5.76)</td>
</tr>
<tr>
<td>60–69</td>
<td>Male</td>
<td>51</td>
<td>8.57</td>
<td>(1.00–18.14)</td>
</tr>
</tbody>
</table>

Table 3. Comparison of near exophoria, near point of convergence and near positive fusional vergence in cases with and without convergence insufficiency

<table>
<thead>
<tr>
<th>Condition</th>
<th>No</th>
<th>Yes</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Near exophoria (prism/dioptre)</td>
<td>2.05±2.60</td>
<td>10.35±2.87</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Near point of convergence (cm)</td>
<td>8.36±4.88</td>
<td>11.15±4.33</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Near positive fusional vergence (prism/dioptre)</td>
<td>15.21±8.02</td>
<td>11.21±4.71</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

*P-value was calculated by independent sample t-test

DISCUSSION

This study is the first population-based study to examine the prevalence of convergence insufficiency in an Iranian population with a relatively large sample and a wide age range. Based on the results of this study, the overall prevalence of convergence insufficiency was 5.51 per cent. Table 5 shows a list of previous studies that have examined the prevalence of convergence insufficiency. As presented in Table 5, varying levels of convergence insufficiency prevalence from 2.25 to 33 per cent have been reported in previous studies and the prevalence found in this study is less than other studies except in four cases. We believe these inter-study differences can be examined from several perspectives. First is the difference in the target population; most studies have been done on children, two studies have been examined the prevalence of convergence insufficiency in young adults and only one study has targeted middle and elder aged people. Given the subjective nature of most binocular vision tests, lack of homogeneity in target populations can be the cause of different convergence insufficiency prevalence rates. The definition of convergence insufficiency in all studies was based on binocular test results and as these tests are often subjective, they completely depend on patients' responses and their understanding of test conditions and expected responses. Therefore, results of diagnostic tests in children may not be as reliable as in adults. For example, children’s failure to understand the concept of sustained diplopia in the NPC test may lead to a remote NPC because they may wish to satisfy the examiner by providing a prompt expected response. In measuring fusion vergence, this can lead to an unrealistic and early report of blur by children and therefore, an underestimation of PFV. Such instances can lead to overestimation of convergence insufficiency prevalence in children. As seen in Table 5, most studies on children have reported a higher prevalence of convergence insufficiency compared to adult studies. In this study, we excluded the results of the under-10-years age group due to the possibility of data inaccuracy, so that prevalence estimates would be as close to true values as possible. Another explanation for the higher prevalence of convergence insufficiency in children is that children may have lower accommodative convergence/accommodation (AC/A) ratios compared to adults and this may result in under-convergence (exophoria), even in the presence of accurate accommodation at near.

Furthermore, higher demand for near work (due to school work and home work) can also explain the higher prevalence of convergence insufficiency in children. Near work will exaggerate the symptoms of convergence insufficiency, forcing the patient to seek optometric care. As most of the previous studies are clinic-based, the higher prevalence of convergence insufficiency in children seems logical from this point of view. It has been known that clinic-based studies overestimate the prevalence of a condition in comparison with population-based studies due to selection bias in the clinical setting.

The second potential factor that could cause inter-study differences is variations in convergence insufficiency diagnostic criteria. Different studies have used different diagnosis criteria; some have used only one criterion and some have used more than three criteria to define convergence insufficiency. According to Table 5, the greater the number of diagnostic criteria, the lower the estimate of the prevalence of convergence insufficiency and studies reporting double digit percentages have mostly used few diagnostic criteria for defining convergence insufficiency. In addition to differences in the number of diagnostic criteria, the cut-off values used for diagnostic test results have been inconsistent and thus, a given individual who is diagnosed with convergence insufficiency in one study may not meet the same criteria in another study. This makes it difficult to compare data between studies. In the present study, we used four diagnostic criteria recommended by the Convergence Insufficiency Treatment Trial Group for the definition of definite convergence insufficiency.
to clinics, such studies are expected to be mostly symptomatic patients who present about half of them are clinical studies. As it all previous studies lack this feature and require population-based studies.\textsuperscript{11} As Table 5 shows, the prevalence rates reported in most clinical studies are significantly higher compared with the present study. On the other hand, non-clinical studies were all done on schoolchildren or college students and due to limitations in sampling methods, sample size and age range, their reported prevalence rates cannot be generalised to the general population.

The fourth reason is the differences among diagnostic testing protocols. The type of target used (for example, accommodative target versus penlight to test NPC), the type of test used (smooth versus step in measuring the fusional vergence, cover test versus subjective tests to measure phoria), as well as other issues, such as the moving speed of the target (NPC test) can affect measurements\textsuperscript{25,30,31} and contribute to inter-study differences. For this reason, the setups used for diagnostic procedures in the present study should be taken into consideration in the interpretation of results.

In this study, in addition to estimating the overall prevalence of convergence insufficiency, we also investigated its prevalence in different age groups of 10 to 19, 20 to 29, 30 to 39, 40 to 49, 50 to 59 and 60 years and over. As previously mentioned, due to limitations of the literature, there is no solid evidence to indicate convergence insufficiency prevalence variations with age and the age-related increase in convergence insufficiency prevalence is merely a speculation based on clinical observations. According to the results of this study, the highest prevalence rates were observed in the 20 to 29 years and 60 years and over age groups and the lowest prevalence was observed in the 50 to 59 years age group. Contrary to our expectations, the findings of this study showed no linear relationship between age and convergence insufficiency prevalence and they even suggested a downward trend in prevalence from 20 to 60 years, albeit there was only about one per cent change in convergence insufficiency prevalence between the ages of 30 and 60 years and we believe this can be considered a negligible change and a relatively constant prevalence. A notable point was the more than the four per cent increase in convergence insufficiency prevalence after the age of 60 years, which indicates a clinically significant increase in the prevalence of this condition after the age of 60 years.

Despite the lack of detailed epidemiological reports, the increasing prevalence of near exophoria in older age had previously been mentioned based on clinical observations and was referred to as presbyopic exophoria.\textsuperscript{32} According to clinical observations, the majority of older presbyopics show increased near exophoria with reduced PFV, which can lead to the development of classic convergence insufficiency symptoms in these people.\textsuperscript{32} Our study confirms these clinical observations. Presbyopic exophoria has mainly been attributed to reduced accommodative amplitude with age and the consequent reduction in accommodative convergence.\textsuperscript{24,33} Another factor contributing to this increase in presbyopic individuals is the induced base-out prismatic effect due to addition lenses that may increase the demand on near PFV, which can lead to decompensation of near exophoria.\textsuperscript{25}

<table>
<thead>
<tr>
<th>Authors</th>
<th>Prevalence (%)</th>
<th>Study setting</th>
<th>Target population</th>
<th>Number of diagnostic signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letourneau and Ducie\textsuperscript{12}</td>
<td>2.25</td>
<td>School</td>
<td>Children</td>
<td>2</td>
</tr>
<tr>
<td>Lara et al.\textsuperscript{13}</td>
<td>3.5</td>
<td>Clinic</td>
<td>Children and young adults</td>
<td>5</td>
</tr>
<tr>
<td>Wajuihian and Hansraj\textsuperscript{14}</td>
<td>4.3</td>
<td>School</td>
<td>Children</td>
<td>4</td>
</tr>
<tr>
<td>Scheiman et al.\textsuperscript{15}</td>
<td>4.6</td>
<td>Clinic</td>
<td>Children</td>
<td>4</td>
</tr>
<tr>
<td>Porcar and Martinez-Palomera\textsuperscript{16}</td>
<td>7.7</td>
<td>University</td>
<td>Young adults</td>
<td>4</td>
</tr>
<tr>
<td>Rouse et al.\textsuperscript{17}</td>
<td>13</td>
<td>School</td>
<td>Children</td>
<td>2</td>
</tr>
<tr>
<td>Pickwell, Viggars and Jenkins\textsuperscript{18}</td>
<td>14</td>
<td>Clinic</td>
<td>Adults</td>
<td>1</td>
</tr>
<tr>
<td>Borsting et al.\textsuperscript{19}</td>
<td>17.3</td>
<td>School</td>
<td>Children</td>
<td>2</td>
</tr>
<tr>
<td>Rouse et al.\textsuperscript{20}</td>
<td>17.6</td>
<td>Clinic</td>
<td>Children</td>
<td>2</td>
</tr>
<tr>
<td>Abdi and Rydberg\textsuperscript{21}</td>
<td>18.3</td>
<td>Not mentioned</td>
<td>Children</td>
<td>1</td>
</tr>
<tr>
<td>Shin, Park and Park\textsuperscript{6}</td>
<td>28</td>
<td>School</td>
<td>Children</td>
<td>4</td>
</tr>
<tr>
<td>Dwyer\textsuperscript{22}</td>
<td>33</td>
<td>Clinic</td>
<td>Children</td>
<td>Not mentioned</td>
</tr>
</tbody>
</table>

Table 4. Prevalence of different types of refractive errors in patients with and without convergence insufficiency

Table 5. Studies reporting the prevalence of convergence insufficiency
Unfortunately, many clinicians and patients consider this finding a part of the normal aging process and therefore, patients may tend not to seek the required treatment or practitioners may fail to offer them. As a result, many symptomatic presbyopic patients with convergence insufficiency are not appropriately treated.\textsuperscript{32} As the majority of these cases are in the age of retirement, it is very likely that they spend a considerable amount of their leisure time doing near work, such as reading print material or computer screens and this issue can affect their quality of life. Based on the findings of this study, which indicates a high prevalence of convergence insufficiency in over 60 year olds, it is recommended to pay special attention to this age group.

We found no association between the prevalence of convergence insufficiency and gender. Although the prevalence was higher in women than in men (5.86 versus 4.78 per cent), the inter-gender difference was not statistically significant. The review study by Cooper and Jamal\textsuperscript{10} in 2012 reported a female to male ratio of three to two but as this was mainly based on a review of clinical studies, the author attributed this finding to the fact that women are more likely than men to refer for optometric or medical care. Thus, gender does not seem to affect the incidence of convergence insufficiency.

In the present study, 12, 57 and 31 per cent of cases with convergence insufficiency, were myopic, emmetropic and hyperopic, respectively. The prevalence of refractive errors in those without convergence insufficiency was almost the same (myopia: 16 per cent, emmetropia: 54 per cent and hyperopia: 30 per cent). Thus, our study showed no significant association between refractive errors and convergence insufficiency, which is consistent with the findings of previous studies.\textsuperscript{10,25,34,35} Considering the relationship between convergence insufficiency and accommodative excess, we expected a higher prevalence of myopia in patients with convergence insufficiency but the results of this study clearly rejected this hypothesis. In two studies by Passmore and Maclean\textsuperscript{34} and Smith,\textsuperscript{35} compared to our study, a higher prevalence of myopia was reported in patients with convergence insufficiency (34 and 38 per cent, respectively); however, this difference does not seem to be due to the relationship between convergence insufficiency and refractive errors and it is probably caused by the different prevalences of refractive errors in the studied populations.

One of the limitations of the present study is that we mainly presented prevalence reports of the last 25 years. There are older studies in this area but unfortunately, we could not access them. Given the possibility of racial differences in the prevalence of convergence insufficiency, we suggest similar studies in other ethnic populations, as well as the standardisation of criteria and diagnostic tests in order to facilitate comparisons.

**CONCLUSION**

According to the present study, the overall prevalence of convergence insufficiency in the Iranian population was 5.46 per cent, which was lower than most previous studies. Convergence insufficiency prevalence had no significant change with age up to the age of 60 years but increased significantly after 60. Convergence insufficiency had no significant relationship with gender or refractive errors.

**REFERENCES**


