Vpliv prekomerne rabe ekranov na vid in oči

Matjaž Mihelčič

Pedagoški inštitut, 7.6.2023

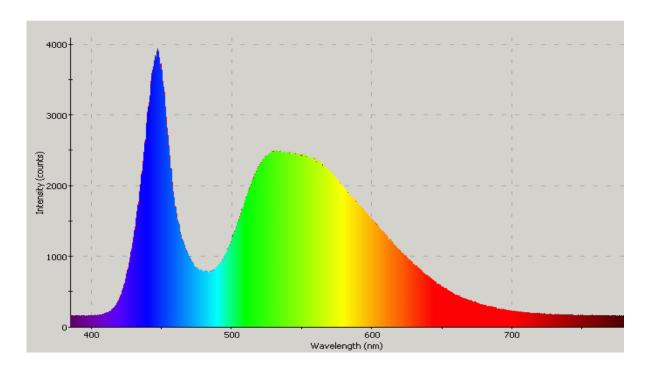
Stres vida in naraščanje kratkovidnosti v zvezi z uporabo digitalnih medijev

Vidni sistem se ob intenzivnem branju z ekrana pogosto ne odziva optimalno

- natančnost akomodacije (autofokusa)
- zenice se ob povečani kognitivni aktivnosti širijo
- neenakomeren spekter LCD ekranov
- prevelik nabor vidnih dražljajev



Tipičen spekter svetlobe LCD ekrana



Vrh vzbujanja pri 450 nm \rightarrow supresija melatonina \rightarrow vzdrževanje budnega stanja Dolina pri pribl. 480 nm \rightarrow slaba stimulacija ip RGC celic

- → spremenjena regulacija zenic, kognitivnih funkcij in cirkadialnih ritmov,
- → nižanje vrednosti mrežničnega dopamina → višanje kratkovidnosti

Kaj je še drugače, če beremo z ekrana?

- 2D dražljaj
- Krajše tipične razdalje branja
 - telefoni < tablice < PC ekrani</p>
 - psihološki efekt, posebej pri mlajših otrocih



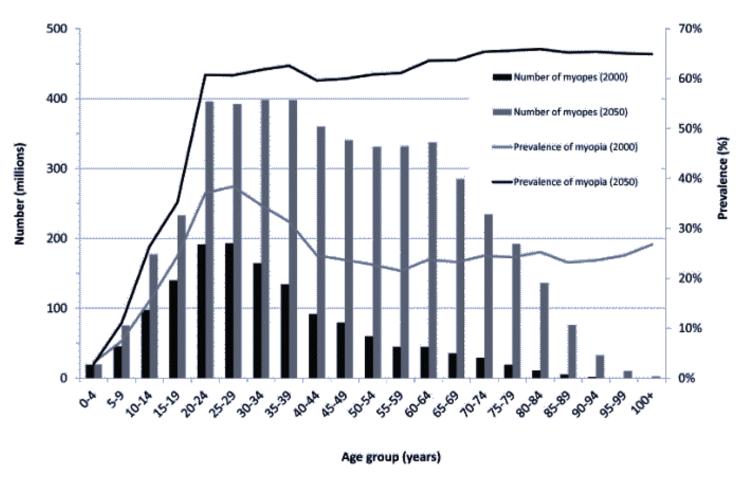




Naraščanje kratkovidnosti

- Azijske države pojavnost do 90 %
- Evropa in ZDA v 30 letih: pojavnost 25% → 42%
- Bolj stresni šolski sistemi, pismenke
- Krajše bralne razdalje
- Manj časa preživetega na dnevni svetlobi
- Več dela na ekranih

Starostna distribucija kratkovidnosti



Metaanaliza, predikcija

Holden BA1 et al.: Global Prevalence of Myopia and High Myopia and Temporal Trends from 2000 through 2050, Ophthalmology. 2016 May;123(5):1036-42. doi: 10.1016/j.ophtha.2016.01.006. Epub 2016 Feb 11.

Razlogi, mehanizem nastanka

- Dednost visoke kratkovidnosti
- Pridobljena kratkovidnost vpliv okolja
 - Jasna povezava stopnje izobrazbe in kratkovidnosti
 - Čas preživet na prostem
 - Čas preživet za ekranom (vpliv lockdownov, šolanja na daljavo v letih 2020 in 2021)
 - Gledanje v telefon na prostem oz. v zaprtem okolju*
 - Povezava z višjo BMI (body mass index)
 - Rast kratkovidnosti med 20. in 50. letom starosti je večja kot smo sprva predvidevali**

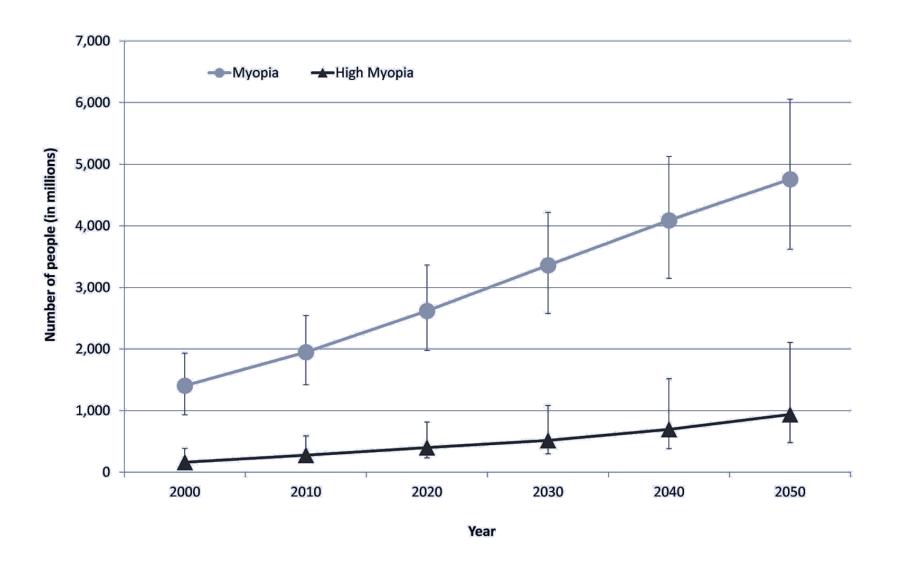
Podaljševanje zrkla – povezani dejavniki

- Defokus ob gledanju na blizu
- Tanjšanje žilnice ob akomodaciji
 - Preveč statična termična obremenitev***
- Mehčanje kolagena beločnice na zadnjem polu očesa
- Manj retinalnega dopamina

^{*}J. Phillips et al.: Smartphone viewing: effects of the visual surroundings on choroidal thickness, 2022

^{**} Bernnan, Cheng, Bullimore: Adult myopia progression, 2022

^{***} Yildrim et al.: Temperature control role of the choroid may affect choroidal thickness after dynamic exercise, 2022



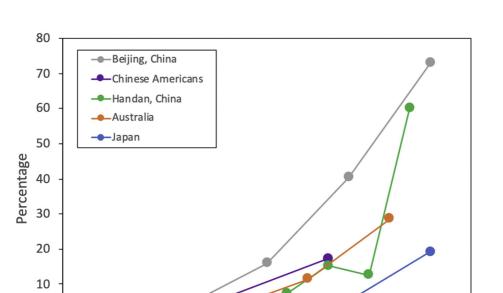
Metaanaliza, predikcija

Holden BA1 et al.: Global Prevalence of Myopia and High Myopia and Temporal Trends from 2000 through 2050, Ophthalmology. 2016 May;123(5):1036-42. doi: 10.1016/j.ophtha.2016.01.006. Epub 2016 Feb 11.

Dolgoročne posledice?

- Odvisnost od korekcijskih sredstev
- Siva mrena
- Glavkom
- Odstopi mrežnice
- Bolezni rumene pege

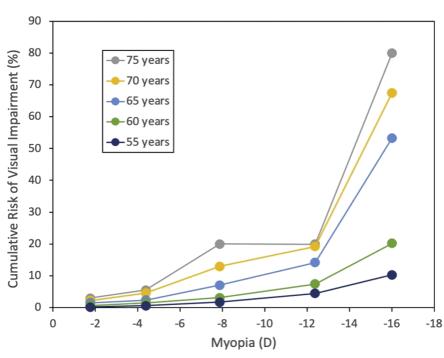
Pojavnost miopične makulopatije z večanjem refrakcijske napake



Myopia (D)

-2

Verjetnost za izgubo vida z večanjem refrakcijske napake in s starostjo



M.A. Bullimore, N.A. Brennan: **Myopia control: why each diopter matters** Optom Vis Sci, 96 (2019), pp. 463-465

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-8



INDIAN JOUENAL OF OPHTHALMOLOGY

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implement safe distances wit activities. We do not yet know

revert and negate the "quarar have clear answers with pos

should be restricted indoor

in all age groups. A balance the health promotion is essential.

References

1. Ganne P, Najeeb S, Chaitanya

Mohan A, Sen P, Shah C, Jain assessment of digital eye st e-learning during the COVI among kids (DESK study-1).

eye strain epidemic amid CO survey. Ophthalmic Epidemi

Impact of COVID-19 Home Confinement in Children's Refractive Errors

Cristina Alvarez-Peregrina 1,* , Clara Martinez-Perez 20, Cesar Villa-Collar 10, Cristina Andreu-Vázquez 10, Alicia Ruiz-Pomeda 3 and Miguel Angel Sanchez-Tena 1,20

- Faculty of Biomedical and Health Sciences, Universidad Europea de Madrid, 28670 Madrid, Spain; villacollarc@gmail.com (C.V.-C.); cristina.andreu@universidadeuropea.es (C.A.-V.); masancheztena@gmail.com (M.A.S-T.)
- Instituto Superior de Educação e Ciências, ISEC LISBOA, 1750-179 Lisboa, Portugal; clara:perez@iseclisboa.pt
- Ophthalmology Department, Hospital Universitario de Móstoles, 28935 Madrid, Spain; aliciaruizpomeda@hotmail.com
- Correspondence: cristina.alvanez@universidadeuropea.es

Abstract: Background: Myopia is a public health problem, with estimations that 50% of the world population will be myopic by 2050. Some environmental factors, such as time spent outdoors, doing pear work, and using digital devices, influence the development of myopia in children. Home confinement in Spain has increased these risk factors, so this study aims to investigate the impact of

home confinement during cross-sectional study in ch a questionnaire about the 2020. Statistical analysis to

Citation: Alvanez-Peregrina, C.; a similar cohort examined Martinez-Perez, C.; Villa-Collar, C. spent less time outdoors ar Andreu-Vázquez, C.; Ruiz-Pomed A.; Sánchez-Tena, M.Á. Impact of vs. 0.48 ± 1.81 D in 2020; COVID-19 Home Confinement in the home confinement at t Children's Refractive Errors, 201. equivalents have decreased Entitron, Res. Public Health 2021, 18. 5347. https://doi.org/10.3390/ Keywords: home confiner

SARS-CoV-2; screen-time Academic Editor: Jitse P. van Dijb

Clinical Optometry

Received: 14 April 202 Accepted: 14 May 202 Published: 17 May 2021

ciated with pathologica Publisher's Note: MDPI stays neutral the posterior pole that ca severity of high myopia published maps and institutional affil-2050 the World Health

Commentary: Behavioral changes in school-going children during the COVID-19 pandemic

In response to the COVID-19 outbreak, the Indian government had imposed an early and precautionary nationwide lockdown in March last year. This made the education of school-going children come to an abrupt standstill. After a few hicrups in the initial months, almost all government and private schools established online education as a norm. As children had to opt for electronic education, children got glued to digital devices. In addition, they consumed more digital media because of boredom and to seek COVID-19-related information. The downside of online learning and excessive screen time started showing its consequences in digital eye strain and adverse effects on children's mental health. [1-4]

Even before the effects of the COVID-19 lockdown were The effect of digit mublished, the impact of health-related issues and isolation on ildren was well documented. Past experiences have told us (less than 6 years)

ORIGINAL RESEARCH

Outbreak of COVID-19-Related Myopia Progression in Adults: A Preliminary Study

Thitika Kohmarn, Noppadol Srisurattanamethakul, Akarapon Watcharapalakorn Teera Poyomtip Chotika Poolsanam

Faculty of Optometry, Ramkhamhaene University, Ranekok, Thailand

1. Introduction

High myopia is no

Correspondence: Chotika Poolsanam, Email chotika@rumail.ru.ac.tl

Purpose: The COVID-19 pandemic has necessitated specific public health measures, resulting in the alteration of lifestyles, such as increased digital screen time and fewer outdoor activities. Such conditions have increased the progression of myopia in children However, no investigation of myopia progression in early adulthood has been conducted during this period. Consequently, this study aimed to evaluate the outbreak of COVID-19-related myopia progression among adults at an optometry clinic during the COVID-19

-Materials and Methods: This was a retrospective cohort study in which participants aged 18–25 years who first visited (baseline) the outometry clinic between June 2019 and March 2020 were recruited for follow-up from November 2021 to March 2022. Spherical equivalent refraction (SER), uncorrected distance visual acuity (UCDVA), and binocular cross cylinder (BCC) were recorded at baseline and a follow-up visit. Using questionnaires, a survey was conducted to assess the lifestyle changes that transpired during th COVID-19 pandemic

Results: In total, 37 participants with a mean age of 22.5±1.4 years were enrolled, of which 89.2% were female. Following the outbreak of the COVID-19 pandemic, most participants self-reported increased daily use of digital devices (89.2%), online education (86.5%), and spending more time at home (94.6%), which increased by approximately 7.6±3.2 hours, 5.9±1.7 hours, and 13.2±7.5 ctively. There were statistically significant differences between SER and BCC at baseline and after approximately 2 years of the COVID-19 pandemic (p < 0.05). The mean two-year myopia progression was -0.59±0.67 D (Maximum = 0.00 D, Minimum

Conclusion: This study revealed that myopia could progress during adulthood among those who have lived under public health measures intended to address the COVID-19 pandemic.

Keywords: adult myopia progression, COVID-19, lifestyle change, optometry clinic

In recent years, the pandemic caused by the coronavirus that arose in 2019 (COVID-19) has had a global impact on almost every aspect of people's lives as various national governments globally implemented public health measures to prevent physical contact and limit viral transmission. People of all ages were obliged to home quarantine, and outdoor activities were forbidden. Such conditions reduced outdoor activities and increased the use of visual display terminal (VTD) to communicate with others as well as maintain productivity, i.e. online learning and working, 2,3 resulting in prolonged digital screen time and blue light exposure. Excessive exposure to blue light can have a harmful effect on the retins and may also contribute to a higher incidence of retins disorder. In addition, previous publications have indicated lifestyle changes such as wearing face masks and increasing digital screen time during containment measures can promote dry eye. 5-7 Moreover, prolonged exposure to digital screens during intensive near-work activities and increased time spent on indoor activities are considered well-known risk factors for myopia progression.⁸

Myopia development is determined by age, the age at which myopia first appears, the duration and intensity o myopia, and ethnic origin. 10,11 Myopia can progress quickly in children and become stable as they grow older

> metry 2022:14 125-131 O SET below or at Set has set is plained and bound by these below limited. The left was of this bound on the limit of the property of the left of the

Perspective

Digital Screen Time During the COVID-19 Pandemic: Risk for a Further Myopia Boom?

CHEE WAI WONG, ANDREW TSAI, JOST B. JONAS, KYOKO OHNO-MATSUI, JAMES CHEN, MARCUS ANG, AND DANIEL SHU WEI TING

. PURPOSE: To review the impact of increased digital device usage arising from lockdown measures instituted during the COVID-19 pandemic on myopia and to make recommendations for mitigating potential detrimental effects on myopia control. . DESIGN: Perspective.

 METHODS: We reviewed studies focused on digital device usage, near work, and outdoor time in relation to myopia onset and progression. Public health policies on myopia control, recommendations on screen time, and information pertaining to the impact of COVID-19 on increased digital device use were presented

dations to minimize the impact of the onset and progression in children wer RESULTS: Increased digital screen t limited outdoor activities were four with the onset and progression of potentially be aggravated during COVID-19 pandemic outbreak perio sures may be short-lived, increased ac and dependence on digital devices cou negative impact on childhood deawareness among parents, children agencies is key to mitigating myopig may become entrenched during this r

CONCLUSION: While it is importa measures to slow or halt the spread o collaboration between parents, school necessary to assess and mitigate the

Accepted for publication Jul 21, 2020. From the Singapore National Eye Center DS.WT.1 and the Singapore Ewe Research In Service (SingHealth) (C.W.W. A.T., M. National University of Singapore Medic Department of Ophthalmology (J.B.)). Med Heldsleber University, Medsleberg. Gen Ophthalmology and Science (K.C.M. Derral University, View, Japan, and Clestify Derral University, View, Japan, and Clestify Derral University, View, Japan, and Clestify

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Elsevier Inc.)

ORIGINAL INVESTIGATION

Effect of Time Outdoors and Near-viewing Time on Myopia Progression in 9- to 11-year-old Children in Chongging

Yujie Fan, MD, Juan Liao, MD, Shichun Liu, MD, Xueqin Cai, BS, Sha Lv, MD, Qiao Yang, BS, Yaoxi Dong, BS, Hua Li, PhD, 1x

SIGNIFICANCE: We used an Alesso device to record the visual behavior of children with myopia in two learning modes. We found that online class mode may increase near-viewing time and reduce outdoor time compared with the traditional shool mode and may be responsible for accelerating myopia progression.

PURPOSE: We aimed to explore the effects of visual behavior in different learning modes on myop is progression among children 9 to 11 years old.

METHODS: Forty-nine children were included and requested to use a wearable device to objectively record visual behavior in real time from November 2019 to November 2020: participants took online classes from mid-February between in neartime to mis-venemez 2019 to inventione 2000, participants taxe contine causes from mis-developed to easily May 2020 during this period. Data (including dissers-weeting films, older of rine, and near-viewing time) were collected during two 14 day periods, which individed the online class learning mode (March 2 to 15, 2020) and the traditional school mode (May 20 to June 2, 2020). Spherical equivalent refraction and axial length were obtained all baseline, at 6-morth intervals, and 1 year later.

RESULTS: Outdoor time during online class mode (median, 9.5 minutes; interquartile range, 0.75 to 48 minutes) was significantly lower than during the school mode (median, 29 minutes; interquartile range, 11.50 to 50 minutes) nutes; P < .001). The mean ± standard deviation of near-viewing time was significantly different between onlin class mode (396.58 + 114.4.1 minutes) and school mode (376.52 + 93.99 minutes; P = 007. F = 19.56). In case mixed (article r = 1.9.4.1 minutely and stroke mode) and the property of the day of minutely r = 3.00 r, r = 1.9.50 p minutely and stroke map as the property of the property

CONCLUSIONS: This study provides evidence of the association of learning mode and myopia progression. Accel-erable progression of myopia in online class mode may be related to increased near-viewing time and decreased time sperit in outdoor activities.

Optom Vis Sci 2 022-99-489-495, doi:10.1 097/0PX.000 000000000 1898 Copyright © 2022 American Academy of Optometry

Previous research concerning environmental factors that influence

myopia has focused mainly on near-viewing and outdoor activities. Basic research, 3 animal studies, 4 cross-sectional studies, 5 longitu-

dinal studies, 6,7 and randomized controlled trials 8,9 have confirmed



Yongchuan Hospital of Chongqing Medical University, Chongqing, Cl ²Central Laboratory, Yongchuan

Lockdown and Myopic Progression.

SUNY College of Optometry,

Sheared Normal University, China

†Those authors share first authorship

Specially section:

This article was submitted to

Keywords: myopia, COVID-19, e-learning, asthenopia, home confinemen

Complex Interplay Between

Tao Cai 1,234, Lianghui Zhao 2,34, Ling Kong 2,3 and Xianli Du 2,34

OPEN ACCESS: Purpose: To compare the myopic progression before and during strict home

Progression

potential influencing factors.

and myopia progression.

COVID-19 Lockdown and Myopic

Shandong First Madical University and Shandong Academy of Madical Sciences, Jihan. China. 2 State Key Laborator Cultivation Basia, Shandong Provincial Kinj Laboratory of Cynthalmology. Eyn Institution of Shandong Flist Modical University.

Glagdao, China. ² Cingdao Eyn Hospital of Shandong First Modical University, Glagdao, China

confinement when coronavirus disease 2019 (COVID-19) outbreak and explore the

Methods: A cross-sectional study. One hundred and fifteen myopic children (115 right

eyes) who replace their frame-glasses from December 2019 to January 2020 and with

complete refractive records in our hospital since myopia were involved in the study. At the

beginning of the strict home confinement and after a 3-month strict home confinement

during the COVID-19 pandemic, they were invited to our hospital to examine the axial

length and refractive errors. And visual functions, convergence insufficiency symptom

survey (CISS) scale and questionnaires were also performed. Besides, the axial length

and refractive errors before the COVID-19 were got from outpatient case files. The

effect of strict home confinement on myopia was assessed by comparing monthly axial

elongation before COVID-19 and during strict home confinement. Spearman correlation

analysis was performed to explore the correlation between potential influencing factors

Results: Axial length's monthly elongation during strict home confinement was 35%

higher than normal periods (0.046 vs. 0.033 mm/month, P = 0.003). The proportion of

severe asthenopia doubled (P = 0.020). For myopia progression, heredity, close indoor

work time and electronic products were risk factors. Besides, the protective factors

were age, rest time after continuous eye usage, sleep time and distance from eye to

Conclusions: During COVID-19, the decline in outdoor activities and increase of

exposure time to digital screens accelerated the progression of myopia by 1/3.

March 2022 I Volumo S I Articlo 853293

JAMA Ophthalmology | Original Investigation

Progression of Myopia in School-Aged Children After COVID-19 Home Confinement

Jiaxing Wang, MD, PhD; Ying Li, MD, PhD; David C. Musch, PhD, MPH; Nan Wei, MD; Xiaoli Qi, MD; Gang Ding, MD; Xue Li, MD; Jing Li, MD; Linlin Song, MD; Ying Zhang, MD; Yuxian Ning, MD; Xiaoyu Zeng, MD; Ning Hua, MD Shuo Li, MD, PhD; Xuehan Qian, MD, PhD

IMPORTANCE Time spent in outdoor activities has decreased owing to home confinement for the coronavirus disease 2019 (COVID-19) pandemic. Concerns have been raised about

CME Questions page 368

SYSTEMATIC REVIEW

dot: 10.3389/lpubh.2022.635449

Pediatric Myopia Progression During the COVID-19 Pandemic Factors: A Systematic Review and

Ze Yang¹¹, Xiang Wang²⁷, Shiyi Zhang¹, Haiyong Ye¹, Yuanqing Chen^{2*} and Yongliang Xia#

³ The First Clinical College, Zhejlang Traditional Chinese Medical University, Hangahou, China, ³ Department of Orthopedics, Tongde Hospital of Zhejlang Province, Hangzhou, China, ³ Department of Tuina, The Third Affiliated Hospital of Zhejlang Chinase Medical University, Hangzhou, China, ⁴ Department of Internal Traditional Chinase Medicine, The First Affiliated Hospital of Zhajlang Chinasa Medical University, Hangzhou, China

OPEN ACCESS

Edited by:

European University of Madrid, Spail First Attiliated Hospital of Chongqing Modical University, China

Background: The COVID-19 pandemic has made many countries adopt restrictive measures like home guarantine. Children were required to study at home, which made parents worried about the rapid myopic progression of their children. To compare myopia progression during the COVID-19 pandemic home guarantine with the time before it and

Methods: We searched PubMed, Embase, the Cochrane Library, and Web of Science to find literature from December 2019 to March 2022 related to COVID-19 pandemic home quarantine and children's myopia progression. Outcomes of myopia progression

dfillations: Department of nology, Emory University, Seorgia (Wang, Y. Li); ent of Ophthalmology and lences, Department of logy, University of Michigan x (Musch); Department of us and Pediatric nology, Tianjin Medicai y Eye Hospital, Tianjin, Chin

y Eye Hospital, Tanjin, C Ding, X. Li, J. Li, Song, ing, Zong, Hua, Qian); ent of Respiratory and ledicine, Tlanjin Medical y General Hospital, hina (S. Li). anding Author: Xueha PhD, Department of us and Pediatric nology, Tianjin Medical y Eye Hospital, 10384, China

Effect of COVID-19 lockdown on refrac errors in Italian children aged 5-12 yea

Edoardo Trovato Battagliola¹, Pietro Mangiantini^{1,*} [], Mattia D'Andrea^{1,*} D, Mariaelena Malvasi^T, Lorenzo Lof Sergio Zaccaria Scalinci³, Anna Maria Comberiati¹,

Clinical Ophthalmology

Purpose: to explore the potential consequences of the COVID-19 lockdown children aged 5-12 years.

dom selection of children who received an eye exam between 2016 to 2021. Inclu routine eye exam. Exclusion criteria: presence of ocular comorbidities other th media opacities corneal or retinal dystrophies, strabismus, amblyopia, or Outcome measure: age and spherical equivalent (SE) measured in diopters

ORIGINAL RESEARCH Myopia Progression Among School-Aged Children

Yasser I Althnayan^{1,2}, Nawal M Almotairi^{2,3}, Manal M Alharbi^{2,3}, Hadeel B Alamer^{2,4}. Hanan B Alqahtani 2-4, Shatha Alfreihi 24,5

¹Ophthalmology Division, Department of Surgery, King Faital Specialist Hospital and Research Center, Ryradh, Saudi Arabic; ¹King Abdullah International Medical Research Centre, Ryradh, Saudi Arabic; ¹Ospartment of Optometry, College of Applied Modical Science, King Saud University, Ryradh, Ryradh Province, Saudi Arabic; ¹Osphalmology Division, Paediatric Surgery Department, ¹Ministry of National Guard - Health Affairs, Ryradh, Saudi Arabic; ¹Oslege of Medicine, King Saud Bar Abdulatat University for Health Sciences, Ryradh, Saudi Arabic

Objective: To investigate the effect of online learning and other environmental factors on myopia progression during the Coronavirus

Methods: A retrospective cohort study from 2018 to 2021. Data from children aged 6-14 were gathered during three visits: prepandemic, at the beginning, and during the pandemic. Demographics (hours spent on screens for educational, recreational purposes, outdoors, and type of screen), best-corrected distance visual acuity (BCDVA), uncorrected distance visual acuity (UCDVA), and

Results: Of 150 patients, 70 [47%] were boys. The mean age was 11 (2.4) years. Participants mainly used mobile phones (62%) and had insufficient outdoor play (88%). Of the 300 eyes, 221 (74%) showed myopia progression. A significant difference in spherical equivalent (SE) was found between pre-pandemic and post-pandemic periods (-0.29 (0.23) D vs -0.40 (0.11) D; p =0.023). Additionally, UCDVA showed a difference between the initial and 1st follow-up visits (0.57 (0.37) vs 0.64 (0.36), p =0.001), and the first and 2nd follow-up visits (0.64 (0.36) vs 0.70 (0.36), p =0.001). Significant hazard ratio for change in SE in patients with higher age (>9 years), (HR [95% confidence interval (CI)], 0.71 [0.51-0.84]), greater recreational screen usage (HR [95% CI], 1.26 [1.15-1.66]), and insufficient outdoor time (HR [95% CI], 1.45 [1.35-1.67]).

Conclusion: Myopia progression was accelerated during the COVID-19 pandemic. Younger age, prolonged screen use, and insufficient outdoor time contributed to increased myopia progression. However, the type of device used had no significant effect. Keywords: myopia, distance-learning, COVID-19, pandemic, school, children

A multi-center retrospective study

Raffaele Migliorini¹ and Elena Pacella¹

Statistical analysis: ANOVA test

in the COVID-19 Distance-Learning Era

Correspondence: Sharba Alfraiht, King Abdullah Specialist Children's Hospital, P.O. Box 22490, Riyadh, 11426, Saudi Arabia, Tel +966-11-8011111, Fax +966-11-8011000 EXT 52273, 53220, Email Alfreihith@ngha.med.sa

cycloplegic refraction were gathered.

Plain Language Summary

Organization (WHO) declared COVID-19 a "pandemic" outbreak.2 As of November 13th, 2020, there were >53 deaths.3 The exponential increase in infections has alarmed citizens across the globe, including heads of state and WHO leaders. 4-6 Research has focused mainly on the epidemiology, risk modelling, pathophysiology, and

N DECEMBER 30TH, 2019, DR WENLIANG LI ALERTED

the world about the possibility of a severe acute

Wuban, China Several months later, the World Health

Original research article

that longer near-viewing time and less outdoor time are risk factors associated with myopia.^{8,10,11} With increased learning pressure on children, many online tutoring classes have begun to be offered, which rely on digital devices like computers and smartphones. The correlation between digital screens and myopia progression is con-troversial. 12-15 The most intuitive assumptions are that increased digital screen time could increase myopia because of increased near-viewing time¹⁶; however, there is currently insufficient evidence to support this.⁷

The outbreak of coronavirus disease 2019 (COVID-19) was declared a global pandemic by the World Health Organization in March 2020. 17 To cut off disease transmission and reduce the risk of infections, students in China were required to take school. classes or tutoring courses online from February to early May 2020.18 During this special period, the learning mode differed

during the aforementioned two periods as well as changes in ocular biometric parameters for 1 year. Participants

from the traditional mode of schooling. In the traditional school mode

students need to complete seven classes every day, with each class

lasting 40 minutes, and they will take a 10-minute rest between each

class, with 21/2 hours of rest and extra physical education class

every day. They do not use computers at school. However, digital screens are widely used in online classes, which may influence

myopia progression.

To objectively record the visual behaviors of children with myopia,

wearable devices were used from November 2019 to November 2020

in our study, which included both periods with learning provided in on-line class mode and traditional school mode. We aimed to explore the

effect of the learning mode on myopia progression among children

aged 9 to 11 years in Chongqing, China, by analyzing visual behaviors

Over the course of this study, a total of 49 children were included Study participants were recruited from the population of children who

my of Optometry. Unauthorized reproduction of this article is prohibite

Prontiers Frontiers in Public Health

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Home Quarantine and the Risk Meta-Analysis

Mair Lotan, Arial University, Israel risk factors of myopia progression, we conducted this study. Cristina Alvaroz-Porocrina

Myopia has reached epidemic proportions around the world. China has one of the highest incidence rates of myopia and is the country with the most severe epidemic of myopia worldwide.^{1,2}

Ukrepi proti rasti kratkovidnosti:

- Ergonomija vida, primerna razdalja do branja, pogosto pogledovanje v daljavo
- Držanje čtiva v rokah
- Dnevna svetloba, gibanje na prostem

Druge, optične in farmakološke intervencije:

- Specialna očala in kontaktne leče
- Kapljice, tablete

Pomembno: t.i. "operacije za dioptrijo" <u>ne</u> izboljšajo stanja oči

Priporočila stroke glede uporabe ekranov pri otrocih:

- WHO: World report on vision 2019 poziv k preventivnim ukrepom zoper porast kratkovidnosti
- Zdravniška zbornica Slovenije: **Smernice za uporabo zaslonov** https://www.zdravniskazbornica.si/informacije-publikacije-in-analize/zasloni

Hvala