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Knowledge, usage and barriers associated with contact lens wear in Ghana

Samuel Abokyi[a,b,*], George Manuh[b], Heinz Otchere[c], Alex Ilechie[b]

[a] School of Optometry, The Hong Kong Polytechnic University, Hong Kong, China
[b] Department of Optometry, University of Cape Coast, Cape Coast, Ghana
[c] Sight for Africa Eye Clinic (Non-Governmental Organization), Accra, Ghana

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ABSTRACT

Background: Despite findings that contact lens wear for vision correction provides better quality of life than spectacles, contact lens use in developing countries is low. This study evaluated knowledge, usage and barriers associated with contact lens wear among spectacle wearers in Cape Coast, Ghana.

Method: A cross-sectional survey using a structured questionnaire was conducted on an adult population of spectacle wearers to assess their knowledge of contact lens wear for vision correction. The participants were proportionately sampled from three eye clinics in the Cape Coast Metropolis, Ghana. Questionnaires were either self-administered or completed with the help of a research assistant.

Results: Of the 422 participants, only 147 (34.8%) knew of contact lens wear for vision correction. The proportion of spectacle wearers reporting history of contact lens wear was 14 (3.3%). Barriers to contact lens wear reported were satisfaction with vision through spectacles 102 (25.0%), lack of adequate information 111 (27.2%), fear of side effects 94 (23.0%) and cost 78 (19.1%). The younger adults and those with higher number of changes of spectacles were more likely to know of contact lenses.

Conclusion: Knowledge and usage of contact lenses among spectacle wearers was low. Contact lens education and demonstration of visual performance through fitting of trial contact lenses on potential candidates may help overcome barriers to contact lens wear.

1. Background

The global magnitude of visual impairment attributable to refractive disorders of the eye is alarming. It is estimated that uncorrected refractive error accounts for distance vision loss in 670 million persons [1], and presbyopia is responsible for impaired near vision in 517 million persons [2]. Sub-Saharan Africa is one of the geographical regions worldwide with the highest burden of vision loss due to refractive conditions [3].

Corrective eyewear, comprising spectacles and contact lenses, remains the most popular modality for vision correction even in developed countries [4–7], despite advancement in surgical refractive corrective procedures including laser-assisted *in situ* keratomileusis (LASIK), photorefractive keratotomy, radial keratotomy, and corneal implants. Contact lens wearers report better quality of life than spectacle wearers [8,9]. Literature suggests that contact lenses are more cosmetically appealing, provide optimal vision due to the minimization in spherical aberration and prismatic effect, and enhances peripheral vision because of the associated lens movement during eye rotation [10,11]. Myopia correction with soft multifocal contact lenses and orthokeratology contact lenses has been found to be promising in delaying myopia progression [12]. This is thought because contact lens correction of on-axis moderate to high myopia results in myopic defocus in the peripheral retina, inhibiting axial growth of the eyeball whereas spherical spectacle lenses induce hyperopic defocus which enhances axial growth of the eye [13]. Also, the demand of some occupations such as sports and theater performance discourage spectacle use [8,9]. Moreover, atypical ocular conditions such as irregular corneal astigmatism, aniseikonia, keratoconus and nystagmus are better managed with contact lenses than spectacles [14–16].

Studies indicate very high contact lens-wearing populations in developed countries including the United States of America, Japan and Saudi Arabia with prevalence estimates ranging from 17 to 70% [17–19]. On the contrary, information gleaned from review of recent surveys on refractive error in developing countries of Sub-Saharan Africa, and particularly in Ghana, suggests that contact lens wear for vision correction is almost negligible [20], despite increase in number of trained optometrists and other eyecare providers equipped with the skill for contact lens fitting. Currently, there are over 300 practicing optometrists in Ghana [21]. Data on the knowledge and barriers toward

* Corresponding author at: School of Optometry, The Hong Kong Polytechnic University, Hong Kong, China.
E-mail address: sabokyi@ucc.edu.gh (S. Abokyi).

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contact lens wear in this population may be essential for formulation of effective strategies to promote contact lens wear. A literature search in Google Scholar and PubMed was conducted to identify studies on knowledge and barriers associated with contact lens wear for vision correction, using keywords including 'knowledge AND contact lens', attitude AND contact lens, barriers AND contact lens. Evaluation of all relevant literature on this topic in the context of Sub-Saharan Africa showed paucity of information with only one study on a subpopulation of spectacle wearers in Nigeria, although with fewer subjects [22]. Besides, no such study was found reporting on any population in Ghana, making it necessary for exploration of such factors. Spectacle wearers have felt the need for refractive correction and, hence, constitute the most likely good contact lens candidates. This study, therefore, assessed the knowledge, usage and barriers associated with contact lenses among spectacle wearers, as a step to enhance advocacy and use of contact lenses.

2. Materials and method

2.1. Ethics and consent to participate

Ethical approval for the study was obtained from the Institutional Review Board, University of Cape Coast, Cape Coast, Ghana. Also, permission was given by each of the three eye care facilities used in the study, all of which are from the Cape Coast Metropolis, namely; the Optometry Eye Clinic of the University of Cape Coast, Eye Unit of the Cape Coast Teaching Hospital, and the Christian Eye Centre in Cape Coast. Informed consent was obtained from each participant by signature or thumbprint, in accordance with the tenets of the Declaration of Helsinki. An impartial witness, who was either a family member of the participants or health staff in those eyecare centers, was involved in interpretation and facilitating the consent process for subjects who were illiterates.

2.2. Sample size

The required sample size was calculated by the function $n = \chi^2 NP(1-P)/[d^2(N-1) + \chi^2 P(1-P)]$, where $\chi^2 = 3.841$ for 1 degree of freedom at the 95% confidence level, Cape Coast population (N) = 169,894, expected prevalence of spectacle wearers (P) = 0.5, desired error bound (d) = 0.05. The desired sample size was 383. This minimum sample size was increased by 20%, giving a total of 460 participants to compensate for non-response and efficiency rates of the questionnaire.

2.3. Study design and sampling

A cross-sectional survey using a structured questionnaire was conducted on an adult population of spectacle wearers who attended the 3 eyecare facilities in the Central region of Ghana from 5th January to 25th March, 2015. These selected facilities have the full cadre of trained eye care personnel and receive high patient attendance. The eligibility criteria for selection of participants into the study were age 18 years and older, habitual wear of spectacles and history of use of spectacles for at least six months for refractive correction. Based upon information on the daily average number of patients attending each eye care facility, a proportionate sample was drawn to constitute the total 460 participants. Thus, 119, 147 and 194 participants were randomly sampled from the visiting patients of the Optometry Eye Clinic, the Eye Unit of the Cape Coast Teaching Hospital, and the Christian Eye Center, respectively.

2.4. Instrument development and data collection

A structured questionnaire to determine knowledge and usage of contact lenses, source of contact lens education and associated barriers to contact lens wear was developed purposely for this study. Selection of the variables to be included in the study was based upon substantive and theoretical relevance of the factors related to the prescription of contact lenses [23]. Other variables considered relevant were included following a deliberation among the eyecare practitioners involved in the study. There were two versions of the questionnaire, the original version in English and its Fante translation, both of which were used in the study. There is no acceptable name for contact lenses since it is quite new to the Ghanaian culture, so same was maintained in the Fante questionnaire. Questionnaire was either self-administered or completed with the help of three trained research staffs for the participants who could not read the questionnaire. It took an average of 5 min for a questionnaire to be completed per respondent. Pretesting of the questionnaire was conducted by experienced researchers in 2 stages; first, a participating pretest was conducted on 15 respondents to elicit their reaction or understanding of questions, followed by an undeclared pretest on another 15 respondents after which some necessary modifications were made to the final questionnaire used for the study.

Data on demographic characteristics (gender, age), social determinants (education, occupation), and spectacle wear characteristics (refractive status, presence of astigmatic correction, presence of near correction, spectacle wear duration, and number of times of change of spectacles) were collected. Information on participants' refractive status, presence of astigmatic correction and presence of near correction was obtained on spot using a lensmeter to measure the powers of the spectacle prescriptions worn. Also, information on the source of contact lens education and barriers associated with contact lens wear was elicited with the questionnaire.

2.4.1. Measured outcomes

The two measured outcomes were spectacle wearers' knowledge of contact lens wear and usage of contact lenses. In order to measure knowledge of contact lens wear, responses to this question were analyzed: "*Which of the following statement(s) is/are true about a contact lens?*" The responses that were available to be chosen were: (1) *It is a less visible lens placed on the eyeball*, (2) *It can be worn to correct vision*, (3) *It can be worn for cosmetic purpose*, (4) *It is an alternative to spectacles use*, (5) *I am not sure*. Responses 1–4 are correct, hence ticking any one of these responses was assigned a score of one. Response 5 was assigned a score of zero. Respondents could tick one or more responses known to be correct regarding contact lenses. The total score per respondent was equal to the sum of scores of all correct responses ticked. However, if any respondent ticked response 5 and any of the other correct responses, that respondent was still scored zero. This was done to discourage respondents from guessing. Also, if a respondent ticked one or more of the correct responses, that respondent was deemed knowledgeable of contact lenses while those who ticked response 5 were considered not knowledgeable.

To assess usage of contact lenses, participants responded to the question "Do you use a contact lens?" The response options were: (1) Yes, I do use it interchangeably with my spectacles, (2) I did use it in the past, (3) No, I don't use a contact lens. Responses 1 and 2 were considered as positive indicators of contact lens usage while response 3 was considered non-usage of contact lenses.

2.5. Data analysis

Statistical data analysis was conducted using Statistical Package for Social sciences (Version 21, SPSS, Inc., Chicago, IL, USA). Data were presented as frequencies and percentages distributions. Binary logistic regression was employed to determine the factors associated with knowledge of contact lens wear. To compare the mean scores in knowledge of contact lens wear by the different sources of education, the Kruskal–Wallis test was used. The threshold for statistical significance was set at a probability of 5%.

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