Structured protocol

Version 8: Annotated

Date of amendment: 11 October 2024

Title: SWISH (See Well to Stay In ScHool: Randomised trial of spectacle distribution to secondary school children with myopia to increase academic high school attendance rates in rural communities)

Aim and objectives:

Aim: To determine whether provision of free spectacles to rural-dwelling Chinese secondary school students with visually-significant refractive error, together with a teacher-based incentive to promote their use, increases the proportion of children going on to academic high school, as opposed to dropping out or pursuing a vocational track.

Objectives:

a. To compare the proportion of children going on to academic high school, dropping out or pursuing a vocational track after they are provided with free glasses at the beginning of trial, and a teacher-focused incentive to wear them (intervention group) to the control group (initially given only prescriptions, with free glasses provided at the end of the trial).
b. To compare spectacle wear among school children in the intervention group and the control group (intermediate analysis).
c. To determine the cost-effectiveness, incremental costs and incremental cost-effectiveness ratio of the intervention.
d. To determine if full correction of shortsightedness slows the progression of shortsightedness compared with under-correction (non-delivery of glasses in the Control group).
e. To determine whether the provision of free spectacles to students with vision impairment can improve their mental health outcomes.

Background:

China's children bear an unfair share of the world's burden of uncorrected refractive error: Among all children with impaired vision due to lack of glasses globally, half dwell in China,[1] a number which is rising and may exceed 100 million by 2020.[2] In fact, over 90% of vision impairment among China's children could be solved with an accurate pair of spectacles.[3] Glasses provide a safe, effective and cheap solution to the problem of refractive error, of which myopia (near-sightedness) is the most common manifestation. Unfortunately, only 15-25% of children needing glasses and living in China's underserved rural western[4] and urban migrant[5] communities have them. Cost issues are not the only barrier. Widespread misconceptions persist among parents, teachers and even health officials that wearing glasses will weaken young children's eyes (increase myopia).[6,7] Our recent trials in China have in fact shown that glasses wear in young children does not in fact worsen myopia,[4] and that simple teacher incentives combined with free spectacles can lead to high rates of children's ownership and use.[8] We have also shown that distribution of free glasses can be sustained through sales of attractive "upgrade" spectacles, even in relatively poor areas.[9] Many of the conditions to promote large-scale government programs of spectacle distribution in China have been fulfilled, in that a very wide-spread and largely-unaddressed disability is now shown to be amenable to safe, inexpensive and sustainable treatment. Improving accessibility of high-quality refractive services in rural areas has in fact been identified as a key priority in China's most recent 5-year Blindness Prevention Plan.[10]

The timing of this project is particularly opportune, as the Chinese government announced in late August 2018 that it was planning a national comprehensive program for management of children's myopia (https://www.iapb.org/news/the-chinese-government-takes-steps-to-tackle-myopia-in-children/). One of the strongest arguments for the Chinese government to expand and continue such national programs of vision screening and spectacle distribution, as other low and middle-income countries have done,[11] is growing trial evidence, largely provided by our research team, that provision of spectacles significantly improves children's educational outcomes.[4,12]

Our two previous, randomised trials in China[4,12] demonstrate that provision of free spectacles significantly improves children's test scores over the course of a single school year. The See Well to Learn Well I (SWLW I) trial[4] enrolled 3177 children (mean age 10.5 years) with under-corrected refractive error at 250 schools in rural western China, and showed significantly higher test scores among children randomised to receive free spectacles compared to Controls given prescriptions only (unadjusted difference in test scores 0.11 SD, 95% CI 0.01 to 0.21, P=0.04). The significant difference persisted when adjusting for child, family and school factors, and was greater than the effect of parental education or family wealth. The effect size increased with increasing use of blackboards (as opposed to textbooks) in classroom teaching, from a non-significant effect among children receiving little or no blackboard teaching to 0.45 SD (P=0.01) among children using the blackboard for most or all teaching. This adds to the biological plausibility of the results, as near-sighted children (the very large majority of participants) would be hampered in their ability to see a distant target such as a blackboard.

These results were confirmed by a similar trial among 1200 children in Shaanxi, western China, in which test scores were significantly higher (0.25 SD, 95% CI 0.01-0.48, P=0.04) among children randomised to referral for spectacles early in the school year as compared to those referred at the end of the school year. To place these results into perspective, the observed effect sizes in these two trials were equivalent to roughly an additional half semester of learning. (www.mdrc.org/publication/459/ful.pdf). An unpublished review of randomized trials with educational outcomes in primary schools in the developing world (http://academics.wellesley.edu/Economics/mcewan/PDF/meta.pdf) has listed 60 health-related trials, including 22 of deworming, with a mean effect size of 0.013 SD, and 38 of nutritional or micronutrient supplementation, with a mean effect size of 0.035 SD. Therefore, the impact on education outcomes with the provision of glasses in this study compares favourably with that of other health-related interventions.

The impact of glasses distribution on educational outcomes, as with other health interventions, has been limited to some extent by low compliance. For example, in SWLW, observed glasses wear among Intervention group participants on un-announced examinations was only 41%. In the See Well to Learn Well II trial (SWLW II),[8] we demonstrated that this problem of poor compliance could be effectively overcome with the use of teacher incentives. Among 728 children (mean age 10.9 years) at 94 urban migrant schools in Shanghai, those randomised to receive free glasses in addition to a teacher incentive had observed wear rates significantly higher (68.3% versus 23.9% on un-announced examination at the end of the school year, OR=11.5, P<0.001) than those of Control children receiving prescriptions only. Use of teacher incentives can yield high rates of spectacle use over the course of a full school year, even using very conservative definitions of wear and in schools serving disadvantaged children of relatively un-educated parents (urban migrants).

We propose in the current trial to significantly expand the evidence base for spectacle distribution as the most-effective health intervention to improve educational opportunities for China's under-served rural children and adolescents by assessing impact on school attainment. Improved performance while in school is undeniably important for a child's future, but interventions that can successfully promote completion of secondary education are even more impactful in facilitating participation in the modern Chinese economy. Children in poor northern areas of rural China such as the regions of Liaoning where the proposed trial is based, have low rates of high school attainment, in the range of 50%.[9,13] Rates of academic high school attainment in wealthier urban areas of the country, by comparison, routinely exceed 90 percent.[11] The impact of additional education on the long-term prospects of these children are substantial: the 10-year lifespan return on college education (for which attendance at academic high school is a prerequisite) is estimated at 42 percent.[13]

Plan of investigation

Study design: This will be cluster-randomised trial, as provision of free glasses to some children and of prescriptions but no glasses to others at the same school will not be practical. The trial will be investigator-masked, but not participant-masked, because the investigators do not feel provision of zero-power spectacles to the Control group is ethical. However, participants will be unaware of the study hypothesis, limiting potential placebo effects.

Study sites: Children in the proposed trial will be enrolled at 120 randomly-selected secondary schools throughout rural Liaoning Province, Northeast China.

Sample size and power calculations: Using STATA 16 software (https://www.stata.com/), we determined a sample size of 111 schools (55 or 56 in each of two study groups). We assume that (based on our previous studies in western China): (a) 120 students per school will undergo vision screening (7th Grade or Middle School Year I), (b) There will be a 50% rate of failing vision screening, (c) 30% of children needing glasses either do not have them or require a more accurate pair (children in the Intervention group already having glasses will still receive a new pair and be enrolled in the trial if their visual acuity with current glasses falls below 6/12). This results in an estimated 18 sample students per school for clustered RCT. Assuming 80% power, with an α of 0.05, intra-class correlation of 0.10, and baseline measures adjustment correlation of 0.40, this study aims to detect a difference of 10% between the groups in the main study outcome (attendance at academic high schools), assuming that the high school attendance rate in the Control group is 50% (based on REAP's recent studies).[7,9] The measurement of clustering within schools used here (ICC=0.10) is based on our previous trials in rural western China.[1,2] We have based the size of difference in main outcome which the trial is designed to detect on other trials carried out by SXNU, Clearly and REAP designed to reduce dropout at the time of high school and boost enrolment into academic high school by way of a counselling program and high school tuition waivers.

Loss to follow-up in our previous school-based trials in China SWLW I and II[4,12] was approximately 4% over the course of one school year, and so our calculations here assume a loss to follow-up of 10% over 2-3 years. However, we have not adjusted for non-compliance because we will use a strict intention-to-treat analytic approach where children in schools allocated to the Intervention group will be analysed as such irrespective of compliance and because our intention is to test the policy of making free glasses available to those students who need them, rather than the effect of those students actually wearing the glasses. Further, our expected effect size is based conservatively on previous trials with

compliance rates of approximately 40%, which we feel can be improved on in the current trial with teacher incentives as above.

Inclusion criteria: Students will be eligible if they are in selected Year 1 classes (likely age 12-15 years) at the recruited schools and have uncorrected (without glasses) visual acuity of ≤6/12 in both eyes; refractive error meets cut-offs shown to be associated with significantly greater improvement in visual acuity when corrected[7] (myopia ≤−0.75 diopters (D, or astigmatism (non-spherical refractive error) ≥1.00 D); and visual acuity can be improved to >= 6/9 in both eyes with glasses.

Exclusion criteria: Hyperopia ≥2.00 D; County schools and schools in Shenyang (urban schools); presence of visually-significant ocular condition besides refractive error,

Sample size calculation to determine if full correction of shortsightedness will slow the progression of shortsightedness compared with under-correction (no glasses in the Control schools).

If we power the study at 80% with an alpha error of 5%, we will need to include a total of 1766 children in our analysis.

Considering a power of 80%, an alpha error of 5%, and an intra-class correlation of 0.10, if 1980 secondary school children with myopia are successfully followed up, we will be able to detect a 20% decrease in the intervention group for all mental health indicators, which include depression, anxiety, self-esteem, and quality of life.

Methods:

1. Participant recruitment: A list of rural middle schools will be obtained from local education bureaus in Liaoning Province. All first-year middle school students (typically aged 12-15) in the selected schools will be included. This sample will represent rural northern China, where high school enrollment rates are low, and students needing glasses have limited access to them. All students whose parents consent will undergo free vision screenings and refraction measurements at school. Eligible students will be randomly assigned to one of two study groups. Recruitment should occur as early as possible in the school year to maximize the educational opportunities after receiving glasses. After vision screening, glasses will be distributed as needed. In previous studies, such as SWLW I, we screened the vision of 20,000 children across 252 schools in western China in one month and distributed glasses as necessary.

2. It is crucial that recruitment of schools and participants take place as early in the school year as possible, in order to maximise children's learning opportunities once glasses are received. We completed vision screening for 20,000 children and spectacle distribution as needed at 252 schools in western China during the SWLW I[1] in a one-month period. Based on this experience and our other trials,[8,12,15] we propose that initial assessment of visual acuity will be completed by teams of volunteer students from He Eye Hospital at all schools within 1 month in December 2024, and that refraction and distribution of spectacles (Intervention schools) and prescriptions (Control schools) will be completed within 2 weeks in January 2025.

3. **Randomization and allocation concealment:** Schools will be stratified by prior high school attendance rates. This stratification will assure balance between the study groups on the main trial outcome at baseline. Within each stratum, a school will be randomly allocated to one of the two intervention groups. Stratification and random assignment will be carried out at a central location (Zhongshan Ophthalmic Centre, Sun Yat-sen

University, Guangzhou, China) by the main study statistician using R software (R Foundation for Statistical Computing, Vienna, Austria) and concealed from the study team until the school has agreed to join the trial and the eligible students have undergone vision screening.

4. **Intervention Group**: Participants in the intervention group schools will receive free single-vision glasses, fitted by optometrists based on refraction results, with single-vision lenses sourced from manufacturers (Youseevue, Danyang, Jiangsu Province; or Hoya, Guangzhou, Guangdong Province). Teachers will distribute the glasses. One week after distribution, optometrists will visit schools to adjust the glasses. Information about the free glasses program and prescriptions will be mailed to parents. All students will be encouraged to wear the glasses during school to ensure clear vision. Additionally, teachers (but not students) will be informed that they will receive a 1,000 RMB cash reward if 80% or more of their students are wearing glasses during subsequent researcher visits. This reward will be provided to the class homeroom teacher. Intervention group students will receive their glasses in December 2024, at the start of the first year of middle school. The intervention's effects on key outcomes are expected to be complete by the end of middle school in 2027, following a 32-month period (2024–2027).

5. Children at **Control schools** will receive a glasses prescription and letter to the parents informing them of the refractive status of their child, with free glasses provided only at the end of the trial. No teacher incentive will be offered. Service offered to the Control group exceeds standard care, in that no school-based programs of vision screening and refraction currently exist in the study area, or in most of rural China.

6. Baseline information for students, parents and teachers will be captured in pre-designed questionnaire (Annex 1, 2, and 3)

7. **Data Collection**: There will be two school-based surveys (starting in December 2024 and November 2025) to collect socioeconomic data, glasses-wearing compliance, academic performance, and, if necessary, provide updated glasses (criteria: corrected vision ≤6/12, lost or broken glasses). A phone survey in June–July 2027 will collect the primary outcome: high school enrollment status.

8. **Masking and bias reduction:** Study personnel assessing trial outcomes will be masked as to children's study group assignment, which will be simplified by the fact that there will be participants with and without glasses at both Intervention and Control schools. As noted above, the investigators do not feel that it is ethical in this setting to provide Control participants with placebo treatment (glasses with zero power lenses), but students, parents and teachers will not be informed of either the overall design of the study or the explicit treatment intervention assignment. We will investigate our results for biologic plausibility (larger effect size among children studying in schools and classrooms where blackboards are used), the presence of which would argue against significant placebo effects from the provision of glasses.

9. The spectacle prescriptions of the children will be determined using Technique of Non-Cycloplegic Subjective Refraction in Adolescents, an effective use of fogging, a technique to achieve accurate spectacle prescription. In standard ophthalmic clinic care, we routinely employ cycloplegic agents like cyclopentolate or atropine to paralyse accommodation and provide reliable and repeatable refractions, but in this case, our research carried out in non-clinical settings, children, parents, and schools sometimes object to the blur and discomfort resulting from its use. Thus, this non-cycloplegic subjective refraction can provide results close to cycloplegic refraction. (Annex 5)

10. **Psychological Assessments**: The Depression Anxiety Stress Scale (DASS) will be used to assess depression and anxiety, the Rosenberg Self-Esteem Scale to measure self-esteem, and the Strengths and Difficulties Questionnaire (SDQ) to measure emotional and behavioral problems. These assessments will be conducted at baseline (November 2024) and at the 12-month follow-up (November 2025). At baseline, all students will be surveyed, while follow-up surveys will only be conducted for eligible students with myopia.

Field Work, Service Delivery and Data management:

Field work will be completed by two teams as follows:

Survey team: This team will implement the survey, conduction vision screening, and secure compliance agreements with the teachers in selected classes at each school. There will 10 teams with 6 members each:

- 1 leader
- 1 assistant
- 2 screeners
- 2 survey administrators

Screeners will assess one class while survey administrators collect questionnaire information from another class, then they will switch. The Team Leader and Assistant will supervise the work and ensure coordination with school management.

Refraction team: This team will either accompany the survey team or follow one day behind to conduct refractions. There will be ten teams of three members each:

- 2 refractionists
- 1 assistant (to help with paperwork and frame selection)

Annex 6,7 and 8 show the screening, refraction form and examination forms to be used in the study.

Data management:

Data entry from paper forms will be carried out by a professional data entry service provider in Beijing and supervised by the team at He Eye Hospital (China). All data will be validated and ‘cleaned’ by the chief study statistician Jin Ling (ZOC). The quality control of data will consist of both manual and computerised checks. To ensure the validity and accuracy of the data and to facilitate the data validation process, a visual check of data entered on a database against the original paper/electronic formats will be completed on a random sample and comprehensive edit checks will be organised. Data queries will be generated for missing data and addressed. All essential documents and study records will be version controlled and archived.

QUB, HEH and ZOC standard procedures for data backup, storage and security will be adhered to. Staff are required to read and follow the relevant security and data usage policies. Paper files (consent forms and relevant questionnaires) will be kept securely in locked filing cabinets in rooms requiring authenticated access in order to gain entry. Access to data will be limited to designated staff only.

QUB and ZOC Research and Governance offices have robust processes for the oversight and governance of research, in particular, research involving human participants. All data used as part of this project will comply with all relevant legal requirements and codes of good practice. Confidentiality and disclosure risk are controlled through the application of information security and data handling policies contained in relevant system level security policies (SLSP). All data will be anonymised and participants' confidentiality maintained throughout. Participants will be allocated a unique ID which will be used to identify all their paper and electronic records. The PI (data custodian) will be responsible for maintaining separate, confidential registers which will match each participant's unique ID with their name. These will be stored securely and separately from other data, with access limited to designated persons. All databases will be designed to ensure completeness, accuracy, reliability and consistency of data. QUB/ZOC policies and procedures ensure that there is no deletion of entered data; a list is maintained of those individuals authorised to make data changes, and all data changes are documented. Quality control measures will be applied to each step in the data management process to assure that the necessary level of data quality is maintained throughout.

The data are held in accordance with the MRC-JISC and ESRC Research Data policies, the Chinese MOH's Regulation on Ethical Review of Biomedical Research Including Human Subjects and QUB and ZOC's Research Governance Policy on management of physical research data and on working with electronic data. Any data held on portable equipment such as laptops, memory sticks or portable hard-drives will be risk-assessed according to the relevant System Level Security Policy (SLSP), taking into account the sensitivity of the information. All data will be transferred to the main data repository where they will be stored on a secure server which is protected against un-authorised access by user authentication and a firewall. All identifiable data will be stored in an encrypted format. A full audit trail will be available to trace the nature of any changes to data, dates of these changes and the person responsible for any changes made. Access to the room where the servers are kept is restricted to designated ZOC IT staff. Daily backup procedures are in place and copies of the data are held in separate locations. A specified group of research staff will have read-only access to the data files containing confidential information; only the database officer can login and alter the confidential personal data files.

Metadata will be collected as an integral process to a) catalogue and index the data in a searchable manner, b) define the assessment tools (scales, key reference publication, modifications etc), and c) describe the data collection process on an individual basis (age at completion, administration and reminder process, version details).

Specific policies applying to the data are described in the QUB and ZOC Research Governance policies on management of physical research data and on working with electronic data, and we abide by the ESRC Research Data Policy on personal information in medical research, and the Chinese MOH's Regulation on Ethical Review of Biomedical Research Including Human Subjects.

Identification of individual study participants is the main security risk. Every step will be taken to manage this risk. To minimise the risks associated with this, only named team members will be able to access the raw data files, and all data will be stored in anonymised format, with the exception of the Administrative Database, maintained to facilitate contact with participants. Procedures will include adequate security of data transfer, storage, and working space and will cover technical aspects such as data encryption and password protection.

Consent statement includes: "We agree that the data collected within this study may be shared with other genuine researchers, as set out in the Participant Information Sheet". Any outside organisation wanting to access the data will need to complete a data sharing agreement. Access to data will be according to our data sharing policy. This is in development and will be updated in due course.

Formal Data sharing agreements with the external study members will not be required; however, their agreement to adhere to the study/ESRC/Chinese MOH policies on data security and management, including confidentiality and data protection, will be marked by their signatures at the end of this document. External users will be bound by a data sharing agreement (in development) which will be made available as part of the application to share data on the study website.

The PI is responsible for data management. The study's lead study statistician (Jin Ling, ZOC) will be involved on a practical level in data management, metadata creation, data security, and quality assurance of data. The PIs will direct the data management process overall, with the UK RA responsible for ensuring metadata production, day-to-day cross-checks, back-up and other quality control activities are maintained.

In terms of copyright clearance, QUB and ZOC shall ensure that their researchers are employed or retained on terms which vest in them sole and exclusive ownership of any copyright and IPR arising from the research project.

Tailored information sheets (Annex 9) and consent forms (Annex 10) will be drafted, based on the sample consent form on p24 of the UK Data Archive Best Practice for Researchers to achieve an informed consent, with adequate information on all aspects of participation and data use to ensure opportunities for sharing research data are not lost.

Measurement of outcomes:

Main outcome:

i. **Attendance at academic high school:** This will be assessed by systematically contacting parents, teachers and students to ascertain enrolment status, which REAP has used to obtain > 97% follow-up in previous studies of high school accession. In the event of inconsistent responses, priority will be given to responses of parents, then teachers and finally students.

Secondary outcomes:

i. **Compliance with spectacle wear:** The main evaluation will be based on actual records of glasses usage (beyond school use) and participant self-reports of "wearing consistently both in and out of school; always in school only" or "sometimes in school only; occasionally in school only; never in school" (see question 42 in the student questionnaire). Teachers and researchers will also assess compliance. For the control group, the research team will directly observe and record glasses-wearing compliance at each follow-up, and will be blinded to the study groups.

ii. **Classroom use of blackboards versus textbooks**: Will be obtained as in our previous studies[4] from teacher reports in the major academic subjects (Maths, Chinese, English).

iii. **Health economics issues:** The primary economic evaluation will use a cost-effectiveness analysis, adopt a societal perspective and confine itself to the trial observation window. Intervention costs will comprise the screening test, glasses (and any replacement thereof) as well as the teacher incentives. Incremental costs will be related to incremental effects measured in terms of the additional proportion of children who enrol in academic school using an incremental cost-effectiveness ratio. Additional analysis will relate incremental costs to incremental mathematic test scores between the intervention and control group. Costs and outcomes will be discounted to reflect their differential timing. As the full benefits of vision correction are unlikely to manifest themselves until several years in the future, a modelling exercise will be used to extrapolate trial results over the expected lifetime of the study participants. In this a cost-utility analysis, a societal perspective will be used. Costs will include the potential savings arising from higher incomes for those who enrol in academic schools as well as the additional costs associated with ongoing screening and replacement of glasses. Costs and outcomes will be discounted.

iv. Mental health outcomes: We will measure the participants' depression and anxiety by using The Depression Anxiety Stress Scale (DASS), self-esteem by using The Rosenberg Self-esteem Scale, emotional and behavioral problems by using the Strengths and Difficulties Questionnaire (SDQ).

Data analysis:

Principal analyses for the main trial will include:

- Adjusted (for major child-, family- and school-level determinants of school attainment including classroom blackboard use) and unadjusted comparison of the difference between study groups in the main outcome, attendance at academic high school after Year 3 of middle school (as opposed to following a vocational pathway or leaving school).
- Adjusted and un-adjusted comparison between groups of observed spectacle wear at un-announced examinations at school and for self-efficacy scores.
- Quality of life and health economics analyses as outlined above
- Adjusted and unadjusted comparison of the difference between study groups in the mental health outcomes after Year 1-2 year of intervention

Sub-group analyses include:

- Comparing the effect size between children falling above vs below the median proportion in recorded wear of spectacles;
- Comparing children stratified on the proportion of classroom teaching in the major subjects using blackboards vs textbooks

Ethics

Ethical clearance will be obtained from Queen' University Belfast, He Eye Hospital, and Stanford University (REAP's parent organisation).

The principal risk to children is failure to receive spectacles to correct their poor vision. No school vision screening programs exist in this part of Liaoning, and our previous studies in western China[4,12] suggest that only 15-20% of children potentially benefitting from glasses will own them. Providing the families of Control participants with prescriptions for glasses and notes detailing their refractive condition delivers a higher level of service than they would otherwise receive, and has been satisfactory to ethics committees in China, the US

and the UK during our previous similar trials. All children will receive complete examinations from optometrists at baseline, and those with ocular conditions requiring treatment will be referred to the local county hospital. All Control children will receive free spectacles at the end of the trial, at the completion of their third year of middle school.

Even though the questionnaires are not diagnostic, there might be some questions in the questionnaires that children might find sensitive. If your child complains of discomfort when answering the questions, our trained interviewers will provide on-the-spot counselling to the students. If the discomfort persists, they will be referred to the nearest Tertiary Hospital for further counselling. Parents will also be informed if their child exhibits any signs of distress when answering the questions so they can provide support at home.

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Annex 1 **Questionnaire No.:** ☐☐☐☐☐☐☐☐☐☐☐☐

SWISH STUDY LIAONING

Student Questionnaire

_____City_____County_____Village/Town

_____Junior High School_____ Class

Student name _____

I. Basic Information

Questions	Alternatives	Answers
1. What's your gender?	1= Male 2= Female	
2. What is your birthday		Year/month/day
3. What's your ethnic group?	1= Han 2= Hui 3= Manchu 4= Mongolian 5= Others. Please specify	
4. What's the type of your registered residence?	1= Countryside 2= Cities and towns 3= Not registered	
5. Where did you live most last semester?	1= At home 2= At school 3= At the relative's house near school 4= Rent a house near school 5= Others. Please specify.	
6. What is the highest education degree you aim to reach?	1=8th grade 2=9th grade 3=vocational middle school 4=vocational high school 5=academic high school 6=vocational college 7=academic college	

	8=graduate school	
7. How likely do you think you will reach your goal of education above?	1= very likely 2=likely 3=not sure 4=not very likely 5=not likely	
8. Have you considered drop out of junior high school?	1=yes 2=no	
9. How do you feel about the level of importance and support your parents place on you continuing to attend high school and university	1 = Very important 2 = Relatively important 3 = No opinion 4 = Somewhat opposed 5 = Strongly opposed	
10. Who is the primary caregiver for you in your family?	1 = Father 2 = Mother 3 = Grandparents 4 = Older brother/sister 5 = Other relatives	

I. Basic Information (Continued)

Questions	Alternatives	Answers
11. How old is your father?	Years old	
12. What's your father's educational background?	1= Not educated 2= Elementary school 3= Junior high school 4= Senior high school or technical secondary school 5= Junior college 6= University and above	
13. Does your father do farm work?	1= Only farm work 2= Only during busy seasons 3= Absolutely not	
14. During the past year, did your father spend a total of more than 6 months living at home?	1= Yes 2= No	
15. How old is your mother?	Years old	
16. What's your mother's educational background?	1= Not educated 2= Elementary school	

	3= Junior high school 4= Senior high school or technical secondary school 5= Junior college 6= University and above	
17. Does your mother do farm work?	1= Only farm work 2= Only during busy seasons 3= Absolutely not	
18. During the past year, did your mother spend a total of more than 6 months living at home?	1= Yes 2= No	
19. What's your family's phone number?	Multiple mobile phone or landline telephone numbers can be filled in, separated by commas.	

Please estimate the likelihood of the following events happening as accurately as possible. The probability ranges from 0% to 100%, with a higher percentage indicating a greater likelihood of the event occurring. A probability of 0% means no chance at all, and 100% means it will definitely happen.

Questions	Alternatives	Answers
20. What is the likelihood that you will leave school before the end of this academic year?	Percentage (0-100)	
21. What is the likelihood that you will take the high school entrance exam?	Percentage (0-100)	
22. At the time of your junior high school graduation, what do you estimate the likelihood will be for each of the following paths?	**Note: a + b + c + d = 100**	
a. Working (not attending high school) Percentage (0-100)		
b. Attending a vocational school (including vocational high school, technical school, etc.) Percentage (0-100)		

c. Attending high school (including key or regular high school) Percentage (0-100)		
d. Other, please specify: _____ Percentage (0-100)		

From Monday to Friday, during school days:

23. How much time do you spend taking a nap during your lunch break?
    (If you don't nap, write "0")
    Total: _____ minutes
24. Do you engage in outdoor activities during your lunch break?
    (Including exercising, playing, shopping, walking, etc.)
    (If you don't do outdoor activities, write "0")
    Total: _____ minutes
25. After school, how much time do you spend studying or reading?
    (Including time spent doing homework)
    (If none, write "0")
    Total: _____ minutes
26. After school, how much time do you spend watching TV?
    (If none, write "0")
    Total: _____ minutes
27. After school, how much time do you spend playing on your phone?
    (If none, write "0")
    Total: _____ minutes
28. After school, how much time do you spend using a computer or playing video games?
    (If none, write "0")
    Total: _____ minutes
29. What time do you go to sleep at night?
    ____ o'clock

III. Current Status of Eyesight

Questions	Alternatives	Answers
30. Have you ever taken the eyesight check organized by school?	1= Yes; 2= No	
31. What was the result of your vision test at school?	1 = The school does not conduct vision tests 2 = Normal vision 3 = Nearsightedness (myopia)	

	4 = Don't know the result 5 = Other, please specify	
32. Do you think you are near-sighted?	1= Yes 2= No 3= Unknown	
33. What do you think is the best solution to myopia?	1= Take balanced diet 2= Have an operation 3= Take medicine 4= Wear glasses 5= Do eye exercises 6= Others. Please specify.	
34. Is anyone in your family near-sighted?	1= Yes 2= No	
35. Does anyone in your family wear glasses?	1= Yes 2= No	
36. Do you think glasses look good on you?	1 = Very good 2 = Pretty good 3 = No opinion 4 = Not very good 5 = Very bad	
37. Have your family members taken you for a vision test?	1 = Yes 2 = No (skip to question 41)	
38. Did the test results indicate that you need glasses?	1 = Yes 2 = No 3 = Don't know	
39. Did your family get you glasses?	1 = Yes 2 = No (skip to question 40)	
40. What are the main reasons your family did not get you glasses? (You can choose more than one)	0 = Not nearsighted 1 = Glasses are too expensive 2 = Concerned that wearing glasses will worsen eyesight 3 = Afraid of being laughed at for wearing glasses 4 = Can still see reasonably well now, will get glasses when vision gets worse 5 = Glasses are inconvenient 6 = Glasses are uncomfortable, cause dizziness, etc. 7 = Other, please specify	
41. Do you have glasses?	1 = Yes 2 = No	
42. How often do you wear your glasses?	1 = Always, both in and out of school 2 = Always, only in school 3 = Sometimes, only in school 4 = Occasionally, only in school 5 = Never in school	

VI. Student psychological test

QUEEN'S UNIVERSITY BELFAST

Reference number: 19.25 version 8

Part 1: Based on your experiences and facts from the past six months, please answer the following questions. Mark the box that best matches your situation on the right side of each question with a "√". Please do not skip any questions, even if you are not entirely sure about some of them.

Item	Not true	Somewhat true	Certainly true
A1. I try to be nice to other people. I care about their feelings	☐1	☐2	☐3
A2. I am restless, I cannot stay still for long	☐1	☐2	☐3
A3. I get a lot of headaches, stomach-aches or sickness	☐1	☐2	☐3
A4. I usually share with others, for example CD's, games, food	☐1	☐2	☐3
A5. I get very angry and often lose my temper	☐1	☐2	☐3
A6. I would rather be alone than with people of my age	☐1	☐2	☐3
A7. I usually do as I am told	☐1	☐2	☐3
A8. I worry a lot	☐1	☐2	☐3
A9. I am helpful if someone is hurt, upset or feeling ill	☐1	☐2	☐3
A10. I am constantly fidgeting or squirming	☐1	☐2	☐3
A11. I have one good friend or more	☐1	☐2	☐3
A12. I fight a lot. I can make other people do what I want	☐1	☐2	☐3
A13. I am often unhappy, depressed or tearful	☐1	☐2	☐3
A14. Other people my age generally like me	☐1	☐2	☐3
A15. I am easily distracted, I find it difficult to concentrate	☐1	☐2	☐3
A16. I am nervous in new situations. I easily lose confidence	☐1	☐2	☐3
A17. I am kind to younger children	☐1	☐2	☐3
A18. I am often accused of lying or cheating	☐1	☐2	☐3
A19. Other children or young people pick on me or bully me	☐1	☐2	☐3
A20. I often volunteer to help others (parents, teachers, children)	☐1	☐2	☐3
A21. I think before I do things	☐1	☐2	☐3
A22. I take things that are not mine from home, school or elsewhere	☐1	☐2	☐3

Item	Not true	Somewhat true	Certainly true
A23. I get along better with adults than with people my own age	☐1	☐2	☐3
A24. I have many fears, I am easily scared	☐1	☐2	☐3
A25. I finish the work I'm doing. My attention is good	☐1	☐2	☐3

Part 2: (Please read each statement and circle a number 1, 2 , 3 or 4 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.)

Item	Did not apply to me at all	Applied to me to some degree	Applied to me to a considerable degree	Applied to me very much
B1.I found it hard to wind down	☐1	☐2	☐3	☐4
B2.I was aware of dryness of my mouth	☐1	☐2	☐3	☐4
B3.I couldn't seem to experience any positive feeling at all	☐1	☐2	☐3	☐4
B4.I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	☐1	☐2	☐3	☐4
B5.I found it difficult to work up the initiative to do things	☐1	☐2	☐3	☐4
B6.I tended to over-react to situations	☐1	☐2	☐3	☐4
B7.I experienced trembling (eg, in the hands)	☐1	☐2	☐3	☐4
B8.I felt that I was using a lot of nervous energy	☐1	☐2	☐3	☐4
B9.I was worried about situations in which I might panic and make a fool of myself	☐1	☐2	☐3	☐4
B10.I felt that I had nothing to look forward to	☐1	☐2	☐3	☐4
B11.I found myself getting agitated	☐1	☐2	☐3	☐4
B12.I found it difficult to relax	☐1	☐2	☐3	☐4
B13.I felt down-hearted and blue	☐1	☐2	☐3	☐4

Item	Did not apply to me at all	Applied to me to some degree	Applied to me to a considerable degree	Applied to me very much
B14.I was intolerant of anything that kept me from getting on with what I was doing	☐1	☐2	☐3	☐4
B15.I felt I was close to panic	☐1	☐2	☐3	☐4
B16.I was unable to become enthusiastic about anything	☐1	☐2	☐3	☐4
B17.I felt I wasn't worth much as a person	☐1	☐2	☐3	☐4
B18.I felt that I was rather touchy	☐1	☐2	☐3	☐4
B19. I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	☐1	☐2	☐3	☐4
B20.I felt scared without any good reason	☐1	☐2	☐3	☐4
B21. I felt that life was meaningless	☐1	☐2	☐3	☐4

Part 3: The following is a set of statements about self-perception. Please check the answer you think is appropriate from the four options on the right side of each statement. Please do not skip any questions, even if you are not entirely sure about some of them.

Question	Strongly Disagree	Disagree	Agree	Strongly Agree
C1. I believe I am a valuable person, at least essentially equal to others.	□1	□2	□3	□4
C2. I feel that I have many strengths.	□1	□2	□3	□4
C3. Overall, I feel like a failure.	□1	□2	□3	□4
C4. My ability to do things is as good as most people's.	□1	□2	□3	□4
C5. I feel like I have nothing to be proud of.	□1	□2	□3	□4
C6. I have a positive attitude towards myself.	□1	□2	□3	□4
C7. Overall, I am satisfied with myself.	□1	□2	□3	□4

Question	Strongly Disagree	Disagree	Agree	Strongly Agree
C8. I wish I could respect myself more.	□1	□2	□3	□4
C9. Sometimes I do feel quite useless.	□1	□2	□3	□4
C10. Sometimes I think I am worthless.	□1	□2	□3	□4

Reference number: 19.25 version 8

Annex 2 **Questionnaire No.:** ☐☐☐☐☐☐☐☐

SWISH STUDY LIAONING

Class Teacher Questionnaire

_____City_____ County/District _____ Village/Town

_____ Junior High School _____ Class

1. Personal Basic Information of Class Teacher

Questions	Alternatives/Unit	Answers
1. What's your name?	Write in words	
2. What's your gender?	1= Male 2= Female	
3. How old are you?	years old	
4. What's your ethnic group?	1= Han 2= Hui 3= Tibetan 4= Mongolian 5= Others. Please specify *	
5. Are you shortsighted?	1= No (go to question no. 8) 2= Yes 3= Unknown	
6. Do you have glasses for the myopia??	1= Yes； 2= No	
7. Do you wear glasses for the myopia?	1= Basically Not 2= Yes when working 3= Often	
8. What's your mobile phone number?	Write in digits	☐☐☐☐☐☐☐☐☐☐☐
9. What is your highest education level?	1= Elementary school 2= Junior high school 3= Senior high school 4= Technical secondary school 5= Junior college 6= Undergraduate 7= Postgraduate 8= Others. Please specify	
10. How long have you been working as a teacher?	Years	
11. When did you get your highest education level?	Year	
12. What's your professional title?	1= Elementary 2= Intermediate 3= Sub-senior 4= Senior	

	5= Others. Please specify	
13. Which level is the highest award you have got as a teacher?	1= Above the county level 2= County level 3= Village/town level 4= School level 5= None	
14. How much did you earn in the school last year?	yuan	
15. hat classes do you teach in this class? (you can choose more than one)	1= Math 2= Chinese 3= English 4= History 5= Physics 6= Biology 7= Chemistry 8= Moral Education 9= Politics 10= Others. Please specify *	
16. How many classes do you have per week in this class?	Classes	

II. Status of Student Eyesight in the Class

Questions	Alternatives/Unit	Answers
17. How many students are there in your class?	Students	
18.How many students live on campus?	Students	
19. How many students are near-sighted in your class?	Students	
20. How many of the near-sighted students in the class have glasses?	Students	
21.How many of the near-sighted students basically don't wear glasses?	Students	
22.How many of the near-sighted students often wear glasses?	Students	
23. What is your opinion on students' wearing glasses?	1= Strongly support 2= Support 3= Whatever 4= Oppose 5= Strongly oppose **	
24. How many students in your class have asked to change their seats because of myopia?	Students	
25. What's the best solution to myopia?	1= Take balanced diet 2= Have an operation 3= Take medicine 4= Wear glasses 5= Take eye exercises 6= Others. Please specify.	
26. Have you ever reminded the students or parents of the eye behavior issues?	1=Never 2= Sometimes 3= Often	
27. Are there any posters or stickers about eyesight preservation in this class?	1= Yes 2= No	
28. Were any lessons or lectures on eye care given in the class?	1= Yes 2= No	

III. Visual Basics Questions (Write 1 for Strongly agree, 2 for Agree, 3 for Have No Idea, 4 for Disagree, 5 for Strongly Disagree)

Questions	Alternatives	Answers
29. Students should have their eyesight regularly checked	1= Strongly agree 2= Agree 3= Have no idea 4= Disagree 5= Strongly Disagree	
30. Eye exercises can solve the problem of myopia	1= Strongly agree 2= Agree 3= Have no idea 4= Disagree 5= Strongly Disagree	

31. Myopia can be solved by wearing glasses	1= Strongly agree 2= Agree 3= Have no idea 4= Disagree 5= Strongly Disagree	
32. Failure to wear glasses after myopia can affect learning	1= Strongly agree 2= Agree 3= Have no idea 4= Disagree 5= Strongly Disagree	
33. Glasses are not necessary when myopia is relatively low.	11= Strongly agree 2= Agree 3= Have no idea 4= Disagree 5= Strongly Disagree	
34. Wearing glasses will make the myopia get worse	1= Strongly agree 2= Agree 3= Have no idea 4= Disagree 5= Strongly Disagree	
35. The junior high school students shouldn't wear glasses	1= Strongly agree 2= Agree 3= Have no idea 4= Disagree 5= Strongly Disagree	

QUEEN'S UNIVERSITY BELFAST

Reference number: 19.25 version 8

Annex 3

Student ID:（ ）

Questionnaire on Glasses Wearing Status of Liaoning Junior High School Students

（ ）City（ ）County/District（ ）Village/Town

（ ）Junior High School（ ）Class

Name of student:（ ）

I. Glasses Wearing Status

Questions	Alternatives	Answers
1. Did your family take you to any other places for an eyesight check after the check organized by school last September?	1= Yes 2= No	
2. Did your family spend money on prescribing glasses for you after the check organized by school last September?	1= Yes 2= No	
3. Do you have glasses?	1= Yes 2= No	
4. Are the glasses you are wearing bought by your parents?	1= Yes 2= No 3= Without glasses	
5. Do you think glasses look good on you?	1= Strongly agree 2= Agree 3= I'm not sure 4= Disagree 5= Strongly disagree	
6. Do you think wearing glasses will you're your learning?	1= Strongly agree 2= Agree 3= I'm not sure 4= Disagree 5= Strongly disagree	
7. Do you usually wear glasses?	1= Basically not 2= Yes when studying 3= Often	
8. If you don't often wear glasses, why? 9. (**Choose only one answer**)	1= Not shortsighted 2= Being worried that eyesight will get worse after wearing glasses; 3= Being afraid of being laughed at by others; 4= Planning to prescribe glasses when my eyesight gets worse since it is still adequate now;	

	5= Thinking it not convenient to wear glasses; 6= Feeling uncomfortable and dizzy when wearing glasses; 7= Not looking nice after wearing glasses 8= Others. Please specify.	
10. What's your parents' opinion on your wearing glasses?	1= Strongly support 2=Support 3= Whatever 4= Oppose 5= Strongly oppose	
11. Have your parents discussed vision issues with you recently?	1= Yes 2= No	
12. Are any of your good friends near-sighted?	1= Yes 2= No	
13. Do any of your good friends wear glasses?	1= Yes 2= No（Skip to question no. 15）	
14. Do they usually wear glasses?	1= Basically not 2= Yes when studying 3= Often	
15. Do you think the glasses look good on them?	1= Strongly agree 2= Agree 3= I'm not sure 4= Disagree 5= Strongly disagree	

II. Questions on Basic Knowledge about Eyesight (write 1 for agree, 2 for disagree, and 3 for have no idea)

16. Questions	Alternatives	Answers
17. Students should have their eyesight regularly checked.	1= Agree 2= Disagree 3= Have no idea	
18. Eye exercises can solve the problem of myopia.	1= Agree 2= Disagree 3= Have no idea	
19. Myopia can be solved by wearing glasses.	1= Agree 2= Disagree 3= Have no idea	

20. Failure to wear glasses after myopia can affect learning.	1= Agree 2= Disagree 3= Have no idea	
21. Glasses are not necessary when diopter of myopia is relatively low.	1= Agree 2= Disagree 3= Have no idea	
22. Wearing glasses will make myopia get worse.	1= Agree 2= Disagree 3= Have no idea	
23. The junior high school students shouldn't wear glasses.	1= Agree 2= Disagree 3= Have no idea	

Annex 5:

Technique of Non-Cycloplegic Subjective Refraction in Adolescents

Underlying concepts:

The starting point in this study is autorefraction performed on subjects. Autorefraction alone, especially in a predominately young and myopic population, frequently results in over-minusing. This study requires accurate refractive data and thus a maximum effort to prevent over-minusing in the subjects.

In standard ophthalmic clinic care, we routinely employ cycloplegic agents like cyclopentolate or atropine to “relax” (actually correctly stated - paralyze) accommodation and provide reliable and repeatable refractions, but in the case of some research projects carried out in non-clinical settings, children, parents, and schools sometimes object to the blur and discomfort resulting from its use. Thus the need for a standardized and effective alternative, careful non-cycloplegic subjective refraction. If done properly, it provides results close to cycloplegic refraction.

Essential to this procedure is the effective use of fogging, a technique to minimize accommodation and over-minusing. Fogging implies the use of additional plus lenses beyond that needed to place the image directly on the retina. Fogging relocates the images to a position in front of both retinas, resulting in blurred distance vision and relaxation of accommodation. Subjective refraction techniques that properly employ fogging minimize the likelihood of over-minusing.

This over-refraction technique has several steps that must be followed carefully after autorefraction measure. The first step is to refine the sphere and then the cylinder of each eye separately. A very important step, too often ignored, is to ensure that accommodation is balanced between the two eyes. This binocular balance step is a bit cumbersome, requiring the use of multiple trial lenses in the frame (or phoropter), and requires the careful attention of both the examiner and the subject. Correct binocular balance is important to guard against prescriptions (and glasses) being uncomfortable for the wearer, thus ending up not being worn.

There are several steps to the process.

1). The first step is to perform autorefraction.

2). Next is to place that prescription in a trial frame or phoropter combined with an additional +2.00D sphere, along with the cylinder and axis found by autorefraction. Make sure the subject now has visual acuity reduced below 20/40 visual acuity (VA) in each eye at distance. If it is not reduced below that, add another +1.00D in front of that eye(s).

3). Now perform subjective spherical over-refraction on the right eye. Reduce the sphere (in the direction of less minus or more plus power) in 0.50D steps until VA improves in steps to 20/25. Ensure that the left eye is constantly blurred throughout this procedure. Repeat on left eye. When both eyes are done, occlude the left eye.

4). Next use the Jackson Cross Cylinder (JCC) to “fine tune” first the power and then the axis of the cylinder of each eye. Have the fellow eye occluded.

5). With the tentative sphere and cylinder determined, next perform a binocular balance test. Place an additional +0.50D sphere in each eye over the tentative sphere derived from the previous Step 4. Next place trial lens or phoropter prisms vertically as follows: 3Δ Base Up OD, 3Δ Base Down OS, while presenting a single 20/30 line of letters. This should now appear to the subject as two vertically displaced and somewhat blurred lines of letters. If there is not vertical diplopia, increase the prism in front of each eye in 1Δ steps until diplopia is recognized. Ask the subject which is better, top, or bottom, or the same, and if not equal, add +0.25D sphere at a time to the clearer eye, until there is equal blur. If the subject is unable to say they are equal, leave slightly more blur on the non-dominant eye.

6). Remove the prisms, returning the subject to single but blurred line of letters. Finally reduce the power on both eyes +0.25D sphere at a time to best corrected distance VA. Stop just before the letters become smaller and darker in size, but not clearer. This is the final endpoint refractive status that is written down.

Reference number: 19.25 version 8

Annex 6

Vision Screening Form

Name of student:

Student ID

Type of accommodation:

1=At home;

2=At school;

3=At the relatives' near the school;

4= Rent a house near the school;

5= Others. Please specify

Part I: Vision Screening

1. Checked on: __Y__M_____D

Uncorrected Visual Acuity (UCVA)	
2. OD	**3.** OS
□6/3	□6/3
□6/3.8	□6/3.8
□6/4.8	□6/4.8
□6/6	□6/6
□6/7.5	□6/7.5
□6/9.5	□6/9.5
□6/12	□6/12
□6/15	□6/15
□6/19	□6/19
□6/24	□6/24
□6/30	□6/30
□6/38	□6/38
□6/48	□6/48
□6/60	□6/60
□6/76	□6/76
□6/96	□6/96
□6/120	□6/120
□6/152	□6/152
□6/192	□6/192
□6/240	□6/240
□< 6/240	□< 6/240

4. Have glasses or not at present?

☐ No, skip to part II

☐ Yes, but not take with him/her, skip to part II

☐ Yes, glasses are taken with him/her (please test his/her eyesight after wearing the glasses):

Visual Acuity After Wearing Glasses	
5. OD	**6.** OS
□6/3	□6/3
□6/3.8	□6/3.8
□6/4.8	□6/4.8
□6/6	□6/6
□6/7.5	□6/7.5
□6/9.5	□6/9.5
□6/12	□6/12
□6/15	□6/15
□6/19	□6/19
□6/24	□6/24
□6/30	□6/30
□6/38	□6/38
□6/48	□6/48
□6/60	□6/60
□6/76	□6/76
□6/96	□6/96
□6/120	□6/120
□6/152	□6/152
□6/192	□6/192
□6/240	□6/240
□< 6/240	□< 6/240

Part II: Inclusion Criteria

7. Included or not

Yes, UCVA of **either eye** ≤ 6/12(0.5) ☐

No ☐

Annex 7

Refraction Form

Name of student: _____ **Student ID** | | | | | | | | | | |

Refraction group ID: _____ **Optometrist:** _____

Part I: Recheck of Visual Acuity

1. Checked on: _____Y____M_____D

Uncorrected Visual Acuity (UCVA)	
2. OD	3. OS
□6/3	□6/3
□6/3.8	□6/3.8
□6/4.8	□6/4.8
□6/6	□6/6
□6/7.5	□6/7.5
□6/9.5	□6/9.5
□6/12	□6/12
□6/15	□6/15
□6/19	□6/19
□6/24	□6/24
□6/30	□6/30
□6/38	□6/38
□6/48	□6/48
□6/60	□6/60
□6/76	□6/76
□6/96	□6/96
□6/120	□6/120
□6/152	□6/152
□6/192	□6/192
□6/240	□6/240
□< 6/240	□< 6/240

4. Have glasses or not at present??

No, skip to part II ☐ Yes ☐

If the student has glasses and takes them with him/her, test his/her eyesight after wearing the glasses:

Visual Acuity After Wearing Glasses	
5. 右眼	6. 左眼
□6/3	□6/3
□6/3.8	□6/3.8
□6/4.8	□6/4.8
□6/6	□6/6
□6/7.5	□6/7.5
□6/9.5	□6/9.5
□6/12	□6/12
□6/15	□6/15
□6/19	□6/19
□6/24	□6/24
□6/30	□6/30
□6/38	□6/38
□6/48	□6/48
□6/60	□6/60
□6/76	□6/76
□6/96	□6/96
□6/120	□6/120
□6/152	□6/152
□6/192	□6/192
□6/240	□6/240
□< 6/240	□< 6/240

Part II: Inclusion Criteria

7. Included or not

Yes, UCVA of **either eye**≤ 6/12(0.5) ☐

No, 10% students with normal VA ☐

Part IV: Refraction

Auto refraction (stick results here)

	S	C	A
OD	**8.**	**9.**	**10.**
OS	**11.**	**12.**	**13.**

Subjective Refraction

	S	C	A	BCVA
OD	**14.**	**15.**	**16.**	**17.**
OS	**18.**	**19.**	**20.**	**21.**

Glasses Prescription

	S	C	A	BCVA
OD	**22.**	**23.**	**24.**	**25.**
OS	**26.**	**27.**	**28.**	**29.**

Axial length

	Average
OD	**33.**

35. Does the student need to fill a prescriptions?

No, end this questionnaire ☐

Yes, continue the test No.36 ☐

36. Pupil Distance：_____mm

Part V: Selection of spectacle frames

37. Spectacle frames no.:

Part VI: if the BCVA is below or equal to_____, the student shall be transferred to the hospital for further check.

38. Does the student need a transfer treatment?

No ☐ Yes ☐

Stick auto refraction results here:

Reference number: 19.25 version 8

Annex 8

Visual Acuity Reexamination Form

District/County: （ ）

Name of student:（ ）

Type of student:（ ）

1= Amblyopic

2= Glasses-prescribed

3= With low vision but without glasses

4= With normal vision

Whether the amblyopic students have their eyesight checked（）： 1=Yes, 2= No

Name of school:（ ）

Student ID:（ ）

Examination group ID:_____

4. Are **free** glasses available?

□ No, go to part II

□ Yes, but not taken, go to part II

□ Yes, they are taken here (Please test his/her eyesight after wearing the glasses)

Part I: Reexamination of Visual Acuity

1. Checked on:__年(Y)__月(M)_日(D)

Uncorrected Visual Acuity (UCVA)	
2. OD	**3.** OS
□6/3	□6/3
□6/3.8	□6/3.8
□6/4.8	□6/4.8
□6/6	□6/6
□6/7.5	□6/7.5
□6/9.5	□6/9.5
□6/12	□6/12
□6/15	□6/15
□6/19	□6/19
□6/24	□6/24
□6/30	□6/30
□6/38	□6/38
□6/48	□6/48
□6/60	□6/60
□6/76	□6/76
□6/96	□6/96
□6/120	□6/120
□6/152	□6/152
□6/192	□6/192
□6/240	□6/240
□< 6/240	□< 6/240

Visual Acuity After Wearing Glasses	
5. OD	**6.** OS
□6/3	□6/3
□6/3.8	□6/3.8
□6/4.8	□6/4.8
□6/6	□6/6
□6/7.5	□6/7.5
□6/9.5	□6/9.5
□6/12	□6/12
□6/15	□6/15
□6/19	□6/19
□6/24	□6/24
□6/30	□6/30
□6/38	□6/38
□6/48	□6/48
□6/60	□6/60
□6/76	□6/76
□6/96	□6/96
□6/120	□6/120
□6/152	□6/152
□6/192	□6/192
□6/240	□6/240
□< 6/240	□< 6/240

Part II: Refraction

7. Whether refraction is necessary

Yes, UCVA of **either eye** □

No, end examination □

Part III: Results of Subjective Refraction last September

(Note: the results of students with normal vision are not filled)

	S	C	A	BCVA
OD	8.	9.	10.	11.
OS	12.	13.	14.	15.

Part IV: Results of Refraction Prescription last September

(Note: the results of students with normal vision are not filled)

	S	C	A	CVA
OD	16.	17.	18.	19.
OS	20.	21.	22.	23.

24. Pupil distance: （ ） mm

Part V: Testing Result of Lensometer (Students with Glasses)

	S	C	A
OD	25.	26.	27.
OS	28.	29.	30.

31. Pupil distance: _____mm

32. Is the testing result consistent with that of glasses prescription?

Yes□ Within error range□ No□

Part VI: New Refraction

Auto refraction (Stick the results on the right side and copy the results here)

	S	C	A
OD	33.	34.	35.
OS	36.	37.	38.

Subjective refraction

	S	C	A	BCVA
OD	39.	40.	41.	42.
OS	43.	44.	45.	46.

Glasses prescription

	S	C	A	BCVA
OD	47.	48.	49.	50.
OS	51.	52.	53.	54.

Axial length

	Reading
OD	

55. Do the results show that it is necessary to fill a new prescription?
□ No, end examination
□ Yes, continue to No.56.
□ Original test is correct, but glasses need to be prescribed

56. Pupil distance:_____mm

Part VI: Selection of Spectacle Frames (For students having filled their first glasses prescription only)

57. Spectacle frames no.

Stick auto refraction results here:

Reference number: 19.25 version 8

Annex 9

Information leaflet for participants

Title: SWISH (See Well to Stay In ScHool: Randomised trial of spectacle distribution to secondary school children with myopia to increase academic high school attendance rates in rural communities)'

Background:

This study aims to determine whether provision of free glasses to children in Liaoning who need them will help with their schoolwork. We will also determine if providing a full description to children will slow down the increase of shortsightedness and improve their mental health well-being. In this study, we will screen the vision of your child, provide them with glasses if they need them and conduct an interview with you and your child.

Trained refractionists will conduct the vision screening and eye examination. The vision screening and eye examination will take about 30 - 40 minutes. The eye examination is not painful and if your child needs glasses, they will be provided free of charge. This examination will NOT require dilation of the pupil with eye drops.

The interview for your child contains a brief assessment of your child's mental health well-being, including depression, anxiety, self-esteem, behaviour and emotional problems. The interview for parents contains a scale to assess your child's quality of life. All the scales have their Chinese version and have been validated and widely used in China. Even though the questionnaires are not diagnostic, there might be some questions in the questionnaires that children might find sensitive. If your child complains of discomfort when answering the questions, our trained interviewers will provide on-the-spot counselling to the students. If the discomfort persists, they will be referred to the nearest Tertiary Hospital for further counselling. We will also inform you if your child exhibits any signs of distress when answering the questions so you can provide support at home.

Your child's participation is entirely voluntary, and he/she may withdraw from this research at any time and for any reason, without having to give an explanation. Your child's participation, or non-participation will not affect his/her treatment. The data collected will be treated securely and confidentially as necessary under the Data Protection Act and stored as required by the Queen's University Belfast.

All results, if published, will be treated in an anonymous manner. No one will be identifiable in any data produced from this study. We will inform you of your child's eye examination results. You can contact researchers with any concerns during the study through the email or telephone number included in the leaflet.

Your child can decide not to answer any questions that are asked. However, as our study requires that we ask your child certain questions to do our research, we hope that they will be willing to answer the questions.

If you have any concerns you may ask now, or later. If you wish to ask later, you may contact the following person:

Project manager: Meng Li
Email: mengli@hsyk.com.cn

Name of Researcher: Prof. Nathan Congdon
Email: ncongdon1@gmail.com
Telephone: +44 7748 751393

Reference number: 19.25 version 8

Annex 10:

Consent Form

Title of the project: SWISH (See Well to Stay In ScHool: Randomised trial of spectacle distribution to secondary school children with myopia to increase academic high school attendance rates in rural communities)

Please initial box

1	I confirm that I have been given and have read and understand the Information Leaflet for the above study. I have had the opportunity to ask, and receive answers to any questions I may have had.	
2	I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.	
3	I agree to take part in the above study, inclusive of the interview procedures mentioned in the Information Leaflet.	
4	I understand that my participation or non-participation will not affect my medical care, or my legal rights being affected in any way.	
5	I understand all data will be treated securely as described by Data Protection and stored appropriately as required by the University.	
6	I understand that I will not be identifiable in any data published in relation to this project.	

I agree to take part in this project

Name of Participant	Date	Signature
Name of Person taking consent (if different from Researcher)	Date	Signature
Meng Li	Date	Signature

Project manager: Meng Li
Email: mengli@hsyk.com.cn Telephone: +8620 87333209

Name of Researcher: Prof. Nathan Congdon
Email: ncongdon1@gmail.com Telephone: +44 7748751393

One copy for Researcher and one copy for the participant