



A Comparative Study of VR Therapy and Traditional Methods for Stress Management

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ABSTRACT—

Stress arising from academic, professional and financial demands is common among students and young professionals, and the coping methods within easiest reach, such as listening to music, do not always suffice. This paper presents a survey-driven design for a virtual reality (VR) gadget that combines selectable immersive natural environments, environment-matched sound therapy and heart-rate biofeedback for short relaxation sessions. An online questionnaire completed by 24 respondents, mostly college students, supplies the user requirements. Among those who answer the relevant items, 65.2% report daily stress, 73.9% name academic or job pressure as the main cause, and 47.8% state that a busy schedule prevents regular yoga or meditation. Music is the most common coping method (63.6%). Asked about a 10–15 minute VR relaxation session described as free of side effects, 83.3% answer “yes, definitely” and 8.3% answer “maybe” if the price is under Rs. 5000. The findings yield design requirements, a system architecture, a session workflow and a protocol for comparing the gadget with guided breathing, meditation and relaxing music. That comparison is planned, not yet carried out: the prototype has not been tested with users, and the paper makes no claim of clinical effectiveness.

Index Terms—biofeedback, sound therapy, stress management, survey, virtual reality.

I. INTRODUCTION

Stress has become a way of life, especially for students, working professionals and married couples. Students experience stress due to studies and career, working professionals face stress due to work and responsibilities, and married couples face stress due to relationships and finances. Some people try to relieve stress through anti-social activities such as smoking, alcohol consumption and drug addiction, despite their harmful effects.

In a fast-paced world, stress is no longer only an occasional emotional response; for many people it has become a persistent condition that affects physical and mental well-being. Prolonged stress is associated with anxiety, depression, hypertension, cardiovascular disease and weakened immune function. Despite this awareness, effective and accessible stress-management options remain limited for the general population.

Dependence on digital devices, academic pressure, competitive workplaces and changing social dynamics raise stress levels across age groups. Students carry the burden of academic performance and an uncertain career. Working professionals struggle to balance work and life while meeting organisational targets. Married couples often face interpersonal conflict and financial pressure. Without healthy coping mechanisms, some individuals adopt harmful habits that give temporary relief but cause long-term damage.

Virtual reality (VR) is being explored as a technological aid in mental health care [1]. Immersive VR places the user in a computer-generated environment that can fill most of the visual field, which may divert attention from everyday stressors. Exposure-based VR therapy is a different application, used mainly for anxiety disorders and phobias [1]; the present work concerns relaxation, not exposure. Sound therapy uses natural and calming audio, and studies of nature sounds report differences in physiological stress recovery [5], [6]. Natural scenes presented through VR have also been examined for relaxation [2].

This research proposes a VR-based gadget for managing stress that combines virtual reality therapy and sound therapy. It also incorporates biofeedback and uses VR glasses to create a virtual world of nature scenes, with the sounds of chirping birds and flowing water, that helps the user relax. The biofeedback indicates body functions such as heart rate during the relaxation session. The research aims to develop a VR-based gadget that helps users manage their daily stress effectively.

The gadget integrates three components: immersive visual therapy, soothing sound therapy and biofeedback. VR glasses take the user into serene environments such as forests, beaches, mountains and flowing water. The audio component provides matched natural sounds such as birdsong, rainfall and flowing water. The biofeedback component displays heart rate from a PPG sensor during the session; breathing rate and skin conductance are possible later additions. Seeing the physiological signal may raise body awareness and encourage regular relaxation practice, although this has not been tested.

The significance of this work lies in its aim of a non-pharmacological, non-addictive and user-friendly option for daily stress management. Unlike methods that need expert guidance or a specific setting, the gadget is intended for use at home, in offices or in educational institutions with minimal setup.

A Google Forms survey of 24 respondents identifies the leading causes of stress and examines whether VR glasses could address them. The planned user study compares the proposed gadget (VR glasses with sound therapy) with traditional meditation and breathing exercises without VR glasses, and with listening to relaxing music as a form of therapy. The comparison is based on the percentage change in stress level, comfort and overall satisfaction after a session, and is meant to show the strengths and limitations of VR-based relaxation relative to conventional methods. This paper does not claim superiority: the prototype has not yet been tested with users, and the paper reports the survey and design stages.

II. RELATED WORK

A. Theoretical background

Two established accounts frame how stress is understood in this paper. Selye described stress as a nonspecific bodily response to demand and proposed the general adaptation syndrome, in which the body passes through alarm, resistance and exhaustion stages when a demand persists [9]. The account explains why frequent, unrelieved stress is a concern and why short, regular periods of recovery are worth designing for. Lazarus and Folkman add that stress depends on how a person appraises a demand against the resources available to meet it, and they separate problem-focused coping from emotion-focused coping [10]. Listening to music or talking to friends, the most common responses in the present survey, can reasonably be read as emotion-focused coping.

Two further theories explain why natural settings may help. Stress recovery theory, supported by the experiment of Ulrich *et al.*, holds that viewing natural scenes after a stressor speeds physiological recovery more than viewing urban scenes [11]. Attention restoration theory proposes that everyday tasks tire directed attention, and that settings which are away from routine, gently fascinating and coherent allow it to recover [12]. Both theories concern real environments. Whether a virtual scene produces a similar effect is the question that the VR studies below begin to address, and this paper does not settle it.

B. Virtual reality for stress and relaxation

Virtual reality generates a computer-synthesised environment that the user views through a head-mounted display and, in many systems, explores by moving the head. Freeman *et al.* review VR in the assessment and treatment of mental health problems and describe the technology as promising while noting that much of the evidence is still early [1]. For relaxation in particular, Anderson *et al.* examine immersive natural scenes presented through VR [2], and Riva *et al.* study the link between the sense of presence in a virtual environment and the emotions it evokes [3]. The common thread is that a believable natural setting can draw attention away from everyday stressors. The experience still depends on display quality and on individual susceptibility to cybersickness, a form of motion sickness caused by visual–vestibular conflict, which is commonly measured with the Simulator Sickness Questionnaire (SSQ) [4].

Slow, paced breathing is the usual companion of such sessions because it is simple to teach and can be guided by an on-screen cue. In VR the cue appears as a gentle visual or audio rhythm, so the user need not count breaths.

C. Sound therapy and relaxation

Alvarsson *et al.* compare recovery from a stressful task under nature sounds and under environmental noise and report differences in physiological recovery between the two conditions [5]. Annerstedt *et al.* combine sound with VR and study stress recovery in a virtual forest with and without the sounds of nature [6]. Together these studies suggest that audio matching the visual scene is an active part of the experience, which is why the gadget pairs each environment with a default sound.

D. Biofeedback and stress awareness

Biofeedback measures a physiological signal and shows it to the person in real time. Lehrer and Gevirtz discuss how heart-rate-variability biofeedback may work and why slow, paced breathing is central to it [7]. A consumer-grade gadget usually has access only to heart rate measured by photoplethysmography (PPG), a light-based sensor worn on the wrist or fingertip. Because heart rate is affected by activity, caffeine and sleep, this work treats it as supporting information that can raise body awareness during a session, not as a diagnostic measure.

E. Traditional methods and self-report measures

Meditation, deep breathing and listening to music are free and widely understood, and any new relaxation tool should eventually be compared against them. Perceived stress is usually captured by self-report, and the Perceived Stress Scale (PSS) is the most widely used standardised instrument [8]. For a single short session a 0–10 rating before and after is more practical, while the PSS suits longer follow-up. Table I summarises the related work.

TABLE I
SUMMARY OF RELATED WORK

Reference	Focus	Relevance to this work
Selye [9]	General adaptation syndrome	Why frequent stress needs regular recovery
Lazarus and Folkman [10]	Appraisal and coping	Frames the coping methods in the survey
Ulrich <i>et al.</i> [11]	Stress recovery in nature	Basis for nature scenes
Kaplan [12]	Attention restoration	Basis for restorative environments
Freeman <i>et al.</i> [1]	VR in mental health	VR is promising; evidence still developing
Anderson <i>et al.</i> [2]	Immersive natural scenes	Basis for nature-based VR environments
Riva <i>et al.</i> [3]	Presence and emotion	Why immersion matters for affect
Kennedy <i>et al.</i> [4]	Simulator sickness	Instrument to monitor discomfort
Alvarsson <i>et al.</i> [5]	Nature sounds	Basis for the sound module
Annerstedt <i>et al.</i> [6]	Virtual forest with sound	Combines VR with matched audio
Lehrer and Gevirtz [7]	HRV biofeedback	Basis for paced breathing and heart-rate display
Cohen <i>et al.</i> [8]	Perceived stress	Standard measure for follow-up studies

F. Summary of the literature

Taken together, the studies cited above support three working assumptions: that natural scenes presented in VR can support relaxation [2], that nature sound matched to the scene adds to the effect [5], [6], and that a visible physiological signal combined with paced breathing can strengthen body awareness [7]. The theories in Section II-A explain why these assumptions are plausible, but the evidence comes mostly from laboratory studies with different samples and measures, so the results are not directly comparable. The literature also makes clear that outcomes depend on the individual and on equipment quality, and that comfort has to be monitored [4]. The present work does not extend these findings experimentally; it uses them to justify the structure of the gadget and to decide what a later trial must measure.

III. PROBLEM STATEMENT AND RESEARCH GAP

A. Problem statement

Young people who feel stressed daily need a relaxation method that fits a busy schedule, is engaging enough to be repeated and is affordable. Music is easy to use but passive, and meditation or yoga needs time and concentration that many people say they lack. The question addressed here is whether a VR-based gadget that joins immersive environments, sound therapy and biofeedback can be designed as a short, personalisable and acceptable additional option for daily stress management. Three research questions guide the work.

RQ1) How often, and for what reasons, do students and young professionals in the sample experience stress?

RQ2) Which coping methods do they use, and what prevents regular relaxation practice?

RQ3) Would they try a short VR relaxation session, and under what conditions?

B. Research gap

Much of the literature studies one component at a time: VR alone, nature sound alone or biofeedback alone [2], [5], [7]. Studies that join all three in a single session and let the user choose the environment according to mood are less common, although this review does not claim an exhaustive search. Many VR studies also use costly laboratory equipment, which limits their relevance for students who must consider price. The present work addresses this gap at the design stage by deriving the requirements of a combined, personalisable and cost-aware system from a survey of the intended users.

C. Objectives of the study

The objectives follow from the research questions. The first is to describe how often respondents feel stress and what they identify as its main cause. The second is to record the coping methods they use and the barriers they report to yoga and meditation. The third is to measure stated willingness to try a short VR relaxation session and the price condition attached to it. The fourth is to turn these findings into design requirements and a system architecture. The fifth is to specify an evaluation protocol in which the gadget is compared with guided breathing or meditation and with relaxing music.

IV. RESEARCH METHODOLOGY

A. Research design

The study follows a survey-driven design approach in three steps. An online questionnaire first captures the stress experience of respondents and their attitude towards VR relaxation. The findings are then converted into design requirements. Finally, a system architecture, a session workflow and an evaluation protocol are prepared for a later prototype and user trial. Only the first step involves data collection from people, and only that step is reported as a result (Fig. 1).

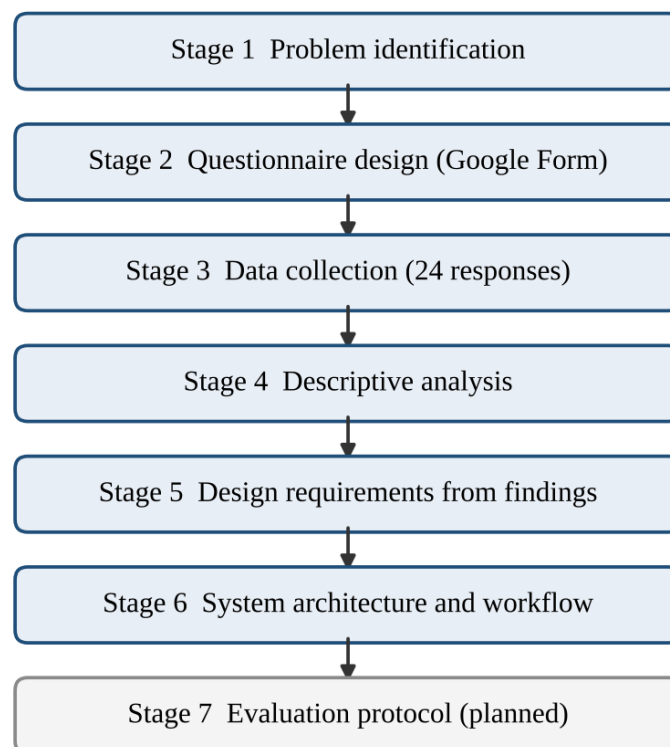


Fig. 1. Stages of the research project. Stages 1–6 are reported in this paper; Stage 7 is planned.

B. Survey instrument

The questionnaire is built with Google Forms and contains eight closed-ended questions: age group, occupation, frequency of stress, main reason for stress, coping method, whether the respondent has tried smoking or alcohol for relief, whether enough time is available for yoga or meditation daily, and whether the respondent would try a VR-based relaxation session of 10–15 minutes without side effects. The full wording and options appear in Table X (Appendix).

C. Respondents and analysis

The form received 24 responses. Not every respondent answered every item, so the number of valid answers per item ranges from 22 to 24, and each percentage is computed on the valid answers to that item. Respondent counts are recovered from the percentages in the form's response summary and reconcile with the item totals. Analysis is descriptive (counts and percentages). No inferential tests are applied because the sample is small and was not drawn at random.

D. Planned user study

The user trial described here has not yet been carried out. Volunteers aged 18 to 30 years attend three sessions of equal length on separate days, one for each condition: the VR session, guided breathing or meditation, and relaxing music. The order of conditions is varied between participants so that practice and fatigue do not favour one condition. People with epilepsy or a known balance disorder, and those who feel unwell on the day, are advised not to take part in the VR condition. The main outcome is the change in the 0–10 stress rating (Section V-F); heart rate, comfort and willingness to use the method again are secondary outcomes. With a small sample, paired comparisons on medians and a rank-based test such as the Wilcoxon signed-rank test suit the data better than tests that assume normality, and effect sizes are reported with any p -values. Participation is voluntary with informed consent, participants may stop at any time, records are stored without names, and the heart-rate display is described as awareness feedback, not a medical reading.

E. Ethical considerations and data handling

The questionnaire asks for no name, e-mail address or other direct identifier, and participation is voluntary. Responses are held in the form's response sheet and are reported only in aggregate. The item on smoking and alcohol asks about past experience and not about current behaviour. Any later trial with the prototype requires written informed consent, a screening step for the exclusions listed above and, in an institutional setting, review by the relevant ethics committee.

F. Scope of the study

The scope of the study is deliberately narrow. It describes the needs and attitudes of a small convenience sample, derives requirements from them, and specifies how the proposed gadget is to be built and tested. It does not report a prototype, a measured change in stress or a comparison of effectiveness. Keeping the scope explicit allows each claim in the paper to be matched with the evidence that supports it.

V. PROPOSED SYSTEM

A. Architecture

The gadget has four parts (Fig. 2, Table II). The VR display module shows 360-degree scenes of a green garden, a forest, a beach or a mountain landscape. The audio module plays sounds that match the chosen scene, such as birdsong, flowing water, rain or soft instrumental music, and the user can change the sound and the volume. The biofeedback module reads heart rate from a PPG sensor and sends it to a mobile application over Bluetooth. The application ties the parts together: it lets the user choose the environment, runs a breathing guide, displays live heart rate and stores the pre- and post-session ratings in a local log.

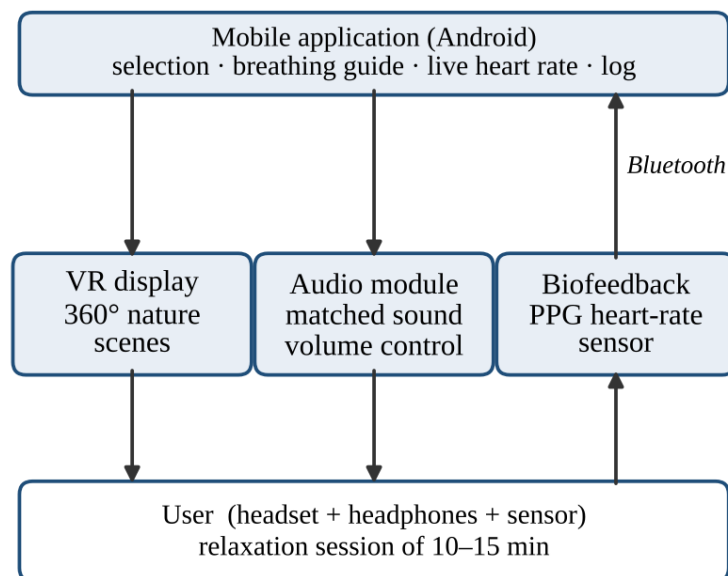


Fig. 2. Block diagram of the proposed VR-based stress management gadget.

TABLE II
COMPONENTS OF THE PROPOSED SYSTEM

Component	Function	Possible implementation
VR display	Shows selectable 360° nature scenes	Standalone headset or smartphone VR viewer
Audio	Plays sound matched to the scene; adjustable volume	Headphones driven by the mobile app
Biofeedback sensor	Measures heart rate and sends it to the app	Wrist-worn or fingertip PPG sensor over Bluetooth
Mobile app	Selection, breathing guide, live display, rating, log	Android application

The implementation column lists options, not a finished build. A smartphone-based viewer is included deliberately because the survey shows that cost matters to some respondents (Section VI).

B. Environments and matched sound

Personalisation means that the user chooses the setting that suits the present mood instead of receiving one fixed scene. Each environment has a default sound (Table III) that the user can replace, and the volume is adjustable. Scene material is intended to come from openly licensed 360-degree video, and the licence of every clip must be checked before use.

TABLE III
ENVIRONMENTS AND MATCHED SOUNDS (DESIGN INTENT)

Environment	Default matched sound	Intended feeling
Green garden	Birdsong with soft instrumental music	Calm and fresh
Forest	Birdsong and wind	Quiet and enclosed
Beach	Ocean waves	Open and slow
Mountain	Wind and flowing stream	Spacious and clear
Peaceful room	Soft flute or instrumental music	Simple and neutral

C. Session workflow

A session lasts 10 to 15 minutes, the duration used in the survey question (Fig. 3). The user first gives a stress rating on a 0–10 scale, chooses an environment and a sound, and puts on the sensor so that a baseline heart rate is recorded. During the session the user may follow a breathing guide (inhale for 4 s, exhale for 6 s) and may watch heart rate on screen. If the user reports dizziness or discomfort, the session stops. At the end the user gives a second stress rating and comfort feedback, and the session is stored in the log.

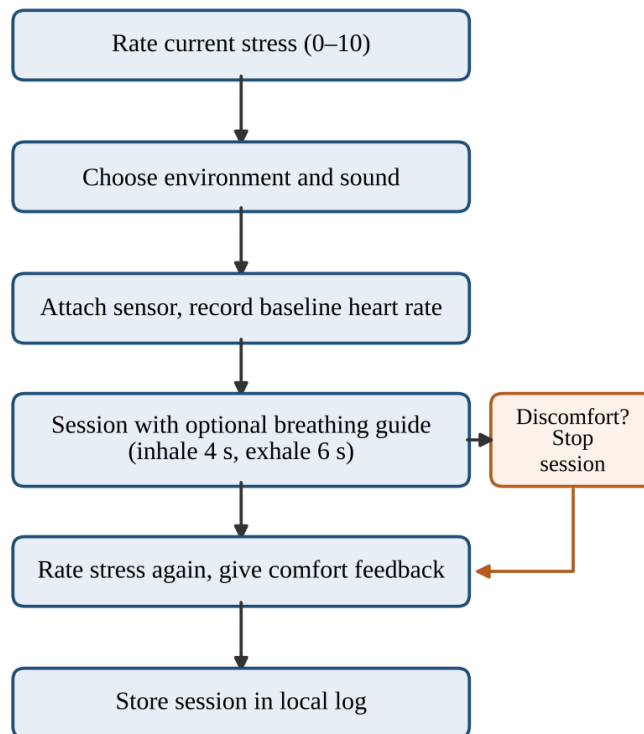


Fig. 3. Workflow of a single relaxation session.

D. Requirements specification

The survey findings and the literature yield the following functional requirements.

- FR1) The user shall be able to choose one of at least four environments before each session.
- FR2) The system shall play a sound matched to the chosen environment and allow the user to change the sound and the volume.
- FR3) The application shall display live heart rate during the session and show a breathing guide on request.
- FR4) The application shall collect a stress rating before and after each session and store it in a local log.
- FR5) The user shall be able to stop a session at any moment, and the system shall record that it was stopped early.

The non-functional requirements concern comfort, cost and clarity: a session does not exceed 15 minutes, the hardware option remains affordable for students, the interface is usable without training, and the heart-rate display is always labelled as awareness feedback and not as a medical measurement. A game engine or WebXR framework can render the scenes, a native Android application can handle control and logging, and Bluetooth Low Energy can link the sensor; the final choice depends on the equipment available for the prototype.

E. Software, data and safety design

The application records one entry per session: date, environment and sound, session length, pre- and post-session stress ratings, baseline and mean heart

rate, comfort rating and a flag showing whether the session ended early. These fields suffice to compute the measures in Table IV and to show the user a simple history. Data stay on the phone and no name is required.

Comfort is part of the design from the start. Sessions are capped at 15 minutes, the user is seated, a stop control is always available, and the workflow ends a session as soon as discomfort is reported (Fig. 3). Cost is also a design constraint: because 8.3% of respondents would try the gadget only if it cost less than Rs. 5000, the architecture allows a smartphone viewer in place of a standalone headset and a low-cost PPG sensor. The actual cost of a built prototype is to be reported once it exists.

F. Planned evaluation

The prototype is to be evaluated in a within-subject comparison of the three conditions described in Section IV-D. The measures are listed in Table IV. For the self-reported rating, the percentage reduction in stress for one session is defined as

$$R = (S_{\text{pre}} - S_{\text{post}}) / S_{\text{pre}} \times 100\% \quad (1)$$

where S_{pre} and S_{post} are the 0–10 ratings before and after the session. The same definition applies to heart rate. Cybersickness symptoms are recorded with the SSQ [4], and the PSS [8] is used if a longer follow-up is carried out.

TABLE IV
PLANNED EVALUATION MEASURES

Measure	Instrument	When
Perceived stress	0–10 rating; PSS [8] for follow-up	Before and after each session
Heart rate	PPG sensor	Baseline and during session
Comfort	Rating; SSQ [4]	After each session
Acceptability	Willingness to use again	End of study

G. Usability and accessibility considerations

Usability is treated as a design requirement and not as a finishing step. The interface is limited to a few large controls that can be operated with a headset on: choosing an environment, choosing a sound, and starting or stopping the session. Text is kept short and readable at the distance of a phone-based viewer, and the breathing guide is shown as a slowly expanding and contracting shape with an optional audio cue, so a user does not need to read instructions while relaxing. Guidance in English and Hindi is planned (Section IX), which matters for a user group that is mostly Indian students and young professionals.

Accessibility also has a hardware side. A headset can be uncomfortable for people who wear spectacles, so the fit, the lens spacing and the weight of the viewer need to be checked with different users. A shared viewer should be cleaned between users, and the sensor should work on either hand. Users with epilepsy or a balance disorder are advised against the VR condition (Section IV-D), and the application states this advice before the first session.

VI. SURVEY RESULTS AND ANALYSIS

A. Respondent profile

Table V gives the profile of the respondents. About half were aged 18–22 years and about half were college students; the rest were working professionals or people preparing for a competitive examination. The sample therefore represents young adults, mainly in education, and the results should be read in that light.

TABLE V
RESPONDENT PROFILE (N = 23)

Category	Respondents (n)	Share (%)
Age 18–22 years	12	52.2
Age 23–26 years	7	30.4
Age 27–30 years	4	17.4
College student	12	52.2
Working professional	6	26.1
Preparing for competitive exam	5	21.7

B. Frequency and causes of stress

Fig. 4(a) answers RQ1 for frequency. Almost two-thirds of respondents (65.2%) report stress daily, 13.0% two times a week and 21.7% rarely. Fig. 4(b) shows the main cause: academic or job pressure (73.9%), financial problems (13.0%), health and family issues (8.7%) and relationship issues (4.3%). Academic and job pressure is the dominant source of stress in this sample, consistent with the profile in Table V.

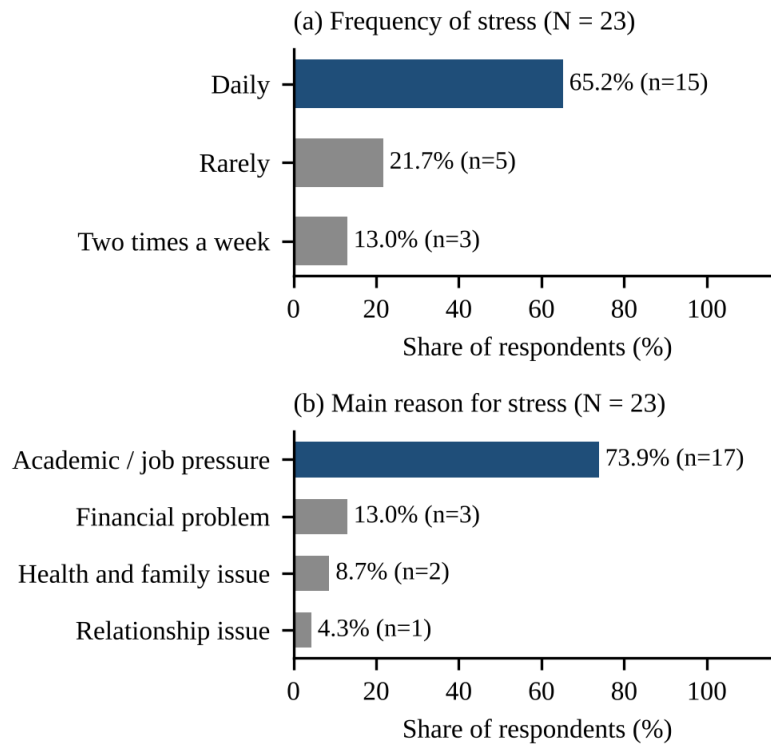


Fig. 4. (a) Frequency and (b) main cause of stress among respondents.

C. Coping methods

Fig. 5(a) shows that listening to music is by far the most common coping method (63.6%), followed by talking to friends (22.7%). Only 9.1% turn to yoga or meditation, and one respondent (4.5%) names smoking and alcohol. A related item (Fig. 5(b)) asks whether respondents have ever tried smoking or alcohol for relief: 73.9% answer no, 21.7% once or twice and one respondent (4.3%) regularly. The two items measure different things and need not match, but together they indicate that about one in four respondents has at some point tried a substance for relief.

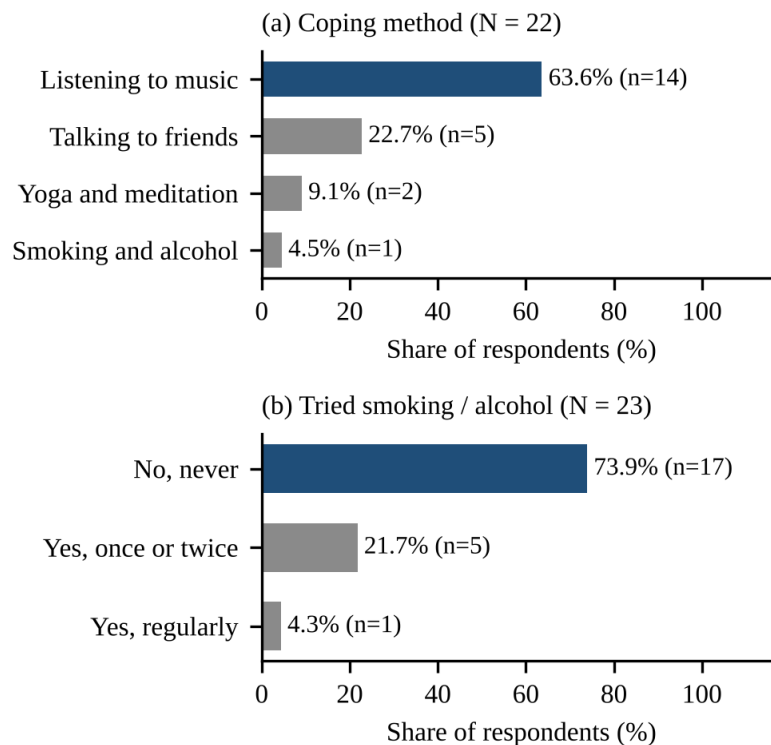


Fig. 5. (a) Coping methods and (b) use of smoking or alcohol for stress relief.

D. Time for relaxation and willingness to try VR

Fig. 6(a) addresses RQ2. Only 21.7% of respondents say they have enough time for yoga or meditation each day; 47.8% say a busy schedule prevents it and 30.4% have tried it and stopped. Lack of time and difficulty in continuing are therefore reported more often than lack of awareness. Fig. 6(b) addresses RQ3. Of 24 respondents, 83.3% would definitely try a 10–15 minute VR session without side effects, 8.3% might if the price is below Rs. 5000, and 8.3% would not. Willingness here is stated interest in a hypothetical product, not evidence of use or benefit.

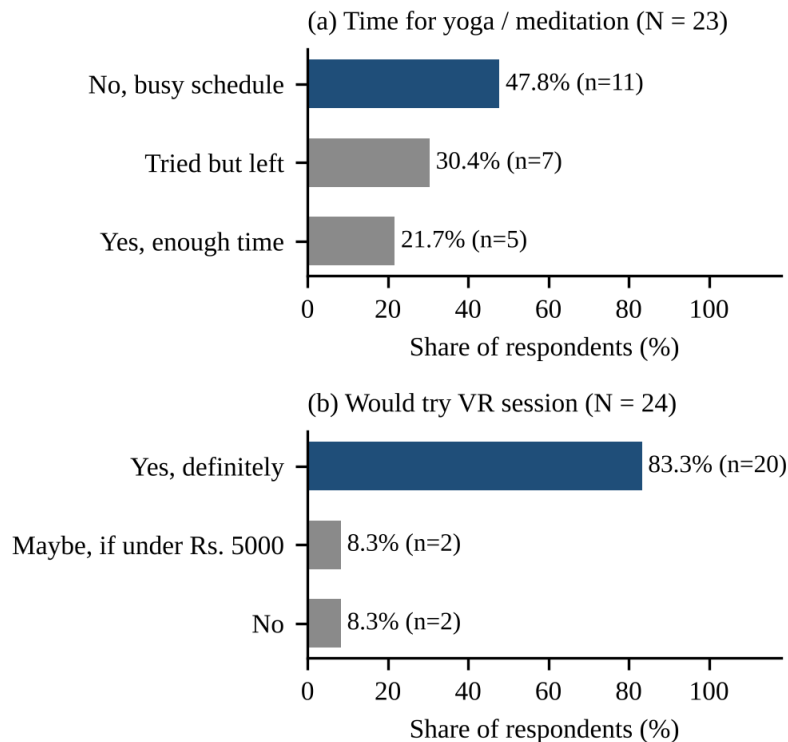


Fig. 6. (a) Time available for yoga or meditation and (b) willingness to try a VR session.

Table VI collects the main result of every item and shows that the number of valid answers varies slightly across items.

TABLE VI
SUMMARY OF SURVEY ITEMS

Item	N	Most common answer (share)
Age group	23	18–22 years (52.2%)
Occupation	23	College student (52.2%)
Frequency of stress	23	Daily (65.2%)
Main reason for stress	23	Academic / job pressure (73.9%)
Coping method	22	Listening to music (63.6%)
Tried smoking / alcohol	23	No, never (73.9%)
Time for yoga / meditation	23	No, busy schedule (47.8%)
Would try 10–15 min VR	24	Yes, definitely (83.3%)

E. Design implications

Table VII links each main finding to a design decision in Section V; this link is the sense in which the system is survey-driven.

TABLE VII
FROM SURVEY FINDINGS TO DESIGN DECISIONS

Finding	Design decision
65.2% feel stress daily	Short sessions that can be repeated every day
47.8% lack time; 30.4% tried and left	10–15 minute sessions; guided breathing to reduce effort
63.6% use music	Audio is a core module, not an add-on
73.9% cite academic or job pressure	Target users: students and young professionals
8.3% would try only if under Rs. 5000	Smartphone-based viewer option to lower cost
Question stressed “no side effect”	Comfort rating and SSQ; stop rule on discomfort

F. Answers to the research questions

RQ1 asked how often and why respondents feel stress. In this sample stress is frequent, with 65.2% reporting it daily, and it is attributed mainly to academic or job pressure (73.9%). RQ2 asked about coping and barriers. Respondents rely mostly on music (63.6%) and conversation (22.7%), and the main barrier to yoga or meditation is time: 47.8% report a busy schedule and a further 30.4% tried and stopped. RQ3 asked about willingness to try a VR session. A large majority (83.3%) say they would definitely try it, and a small group (8.3%) would do so only if the price is below Rs. 5000. These answers describe the respondents; they do not show that the gadget works.

VII. DISCUSSION

A. Interpretation of the findings

The survey describes a group that is stressed often, mostly for academic or work reasons, and that copes with passive and easily available methods. Music dominates while yoga and meditation are rare, and the reason given is time more than disinterest. A short, structured and engaging session may suit this situation because it asks for ten to fifteen minutes and removes the need to create a calm setting for oneself.

Each design decision, namely session length, session cap, smartphone viewer and stop rule, traces to a figure in Table VII, so the design can be defended and revised as new data arrive. The same table shows where evidence is missing, and those gaps define what the user trial must measure.

The high willingness to try VR (83.3%) is encouraging but needs careful reading. The question described the session as relaxing and free of side effects, which makes a positive answer more likely, and respondents considered an imagined device rather than a real one. The conditional answers show that price is a real barrier for some. The willingness figure is therefore used to justify building and testing a prototype, not to claim that the gadget works.

Two further points follow. First, respondents who tried yoga or meditation and then stopped (30.4%) accept the idea of relaxation practice but did not sustain it, so a guided and engaging session may suit them. Second, about a quarter of respondents have tried smoking or alcohol at least once for relief. This does not show that the gadget could replace those habits, but it suggests that students look for quick relief and would welcome a healthier option of similar speed.

The design combines three components that have each been studied separately [2], [5], [7]. Whether the combination adds value over its parts, and over simple music or breathing, is the empirical question the planned evaluation in Section V-F is meant to answer.

B. Traditional methods and the proposed gadget

Because the title refers to a comparison, it is useful to set out how the two groups of methods differ in practice, even though effectiveness is not compared here. Table VIII lists general characteristics only. Meditation, breathing exercises and music need little or no equipment and are available at once, but their benefit depends on regular practice and on the person's ability to concentrate or to find a quiet place. The proposed gadget removes the need to build a calm setting and adds a visible feedback signal, but it requires hardware, a charged device and a short set-up, and it brings a risk of discomfort that traditional methods do not have. Neither group is assumed to be better. The planned trial in Section V-F is designed to compare them on stress change, comfort and satisfaction.

TABLE VIII
GENERAL CHARACTERISTICS OF TRADITIONAL METHODS AND THE PROPOSED GADGET

Aspect	Traditional methods	Proposed gadget
Main approaches	Meditation, breathing exercises, yoga, relaxing music	Immersive nature scene, matched sound, heart-rate display
Equipment	Little or none	Headset or smartphone viewer, headphones, optional sensor
Setting	Depends on the user's surroundings	Virtual scene chosen by the user
Guidance	Self-guided or instructor-led	Built-in breathing guide
Feedback	Usually none	Live heart rate (awareness only)
Main barrier	Time and difficulty in continuing (Table VI)	Cost, comfort and technical set-up
Evidence here	Reported use only	Reported willingness only

C. Practical risks and mitigation

Table IX collects the main practical risks identified in the design and the measures intended to reduce them. The list is not exhaustive, and each measure has to be checked once the prototype exists.

TABLE IX
PRACTICAL RISKS AND PLANNED MITIGATION

Risk	Cause	Planned mitigation
Cybersickness	Visual-vestibular conflict, long sessions	Seated use, 15-minute cap, stop control, SSQ [4]
Misreading heart rate	Activity, caffeine and sleep affect the signal	Label as awareness feedback; record a baseline
Cost barrier	Price of a standalone headset	Smartphone viewer option; low-cost PPG sensor
Scene licensing	Reuse of third-party video	Use openly licensed clips; record each licence
Privacy	Session data on the phone	Local log only; no name required
Over-reliance	Using the gadget instead of support	State that it is not a substitute for professional care

VIII. LIMITATIONS

- 1) The sample is small (24 respondents) and not randomly selected, so the percentages cannot be generalised to all students or young professionals.
- 2) All data are self-reported and may be affected by recall or question wording.
- 3) The VR question mentions relaxation without side effects, which may encourage positive answers, and concerns a hypothetical device.
- 4) Valid answers differ between items (22 to 24), and the survey records neither gender nor other background variables.

- 5) The prototype is untested, so nothing in this paper shows that the system reduces stress.
- 6) Heart rate is an incomplete indicator of stress because activity, sleep and caffeine affect it.
- 7) VR can cause dizziness or discomfort in some users, and headset cost may limit access.
- 8) The system is not a substitute for professional mental health care.
- 9) The survey does not allow comparison between subgroups, for example students and professionals, because the number of respondents in each group is too small.
- 10) No inferential statistics are reported, so differences between answer categories are descriptive and should not be read as statistically significant.
- 11) Recruitment was by convenience, and respondents may resemble one another in age, education and online access, which limits how far the findings carry.

IX. FUTURE SCOPE

- 1) Build the prototype and run the within-subject comparison of Section V-F with a larger and more varied group.
- 2) Study longer use, for example daily sessions over several weeks with weekly stress tracking, to see whether any benefit lasts.
- 3) Allow richer personalisation, including the user's own photographs or videos converted into VR scenes.
- 4) Explore more comfortable and cheaper sensors, such as smart rings or watches that people already own.
- 5) Add guided yoga, a virtual meditation instructor, guidance in Hindi and English, and support for low-end smartphones.
- 6) Recruit a larger and more varied sample, including participants from several institutions and from outside education, and report subgroup results.
- 7) Seek institutional ethics review before any trial with the prototype, and fix the protocol, instruments and analysis plan in advance.
- 8) Compare the gadget with an active control, such as the same scene shown on a flat screen, to separate the effect of immersion from the effect of nature content and sound.

X. CONCLUSION

This paper presents a survey-driven design for a VR-based gadget that combines immersive natural environments, matched sound therapy and heart-rate biofeedback. In a survey of 24 respondents, most of them young students, daily stress is common, academic and job pressure is the leading cause, and a busy schedule is the most frequent barrier to regular yoga or meditation. A large majority would try a short VR session, with a minority conditioning this on a low price. These findings shape the system architecture, the 10–15 minute session workflow and the evaluation plan. The work does not show that the gadget reduces stress. That claim requires a built and tested prototype compared against music and breathing in a larger study, which is the next stage of the project.

The main contribution of the work is a traceable link between what a small group of users reported and what the gadget is designed to do. Each requirement can be followed back to a survey item, and each open question has a matching measure in the evaluation plan. This makes the design easy to defend, and equally easy to revise if the trial shows that part of it does not work.

APPENDIX

Table X lists the survey questions and answer options as they appear in the online form.

TABLE X
SURVEY QUESTIONNAIRE

No.	Question	Answer options
1	Age group	18–22; 23–26; 27–30
2	You are a?	College student; working professional; preparing for competitive exam
3	How often do you feel stress?	Daily; two times a week; rarely
4	What is the main reason for your stress?	Academic / job pressure; relationship issue; financial problem; health and family issue
5	What do you do to cope with stress?	Listen to music; talking to friends; yoga and meditation; smoking and alcohol
6	Have you ever tried smoking or alcohol to get relief from stress?	Yes, once or twice; yes, regularly; no, never
7	You get enough time for yoga/meditation daily?	Yes; no due to busy schedule; I tried but left
8	If VR-based glasses can give you relaxation in 10–15 minutes without any side effect, will you try it?	Yes, definitely; maybe, if price is affordable (under Rs. 5000); no

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