

## **Participant Information Sheet (Retrospective)**

**Study Title:** Chronotype-Aligned Exercise Timing in Middle-Aged Adults at Cardiometabolic Risk: A Randomized Controlled Trial

### **Purpose of the Study:**

This study investigated whether exercising at a time that matches an individual's chronotype (morningness or eveningness preference) improves heart health, metabolism, and sleep in adults at risk of cardiovascular disease.

### **Study Procedures:**

- Participants were classified as **morning-type or evening-type** using a questionnaire and 48-hour core body temperature monitoring.
- Participants were **randomly assigned** to exercise either at their preferred time (chronotype-aligned) or non-preferred time (chronotype-misaligned).
- The exercise program included **moderate-intensity aerobic exercise**, 40 minutes per session (5 min warm-up, 30 min main, 5 min cool-down), **5 times per week for 12 weeks**, supervised at the hospital gym.
- Heart rate was monitored during sessions for safety, and a physician was present.

### **Duration:**

Participation lasted **12 weeks**, with assessments before and after the intervention.

### **Potential Risks:**

- Mild muscle soreness, fatigue, or minor injuries.
- Rare cardiovascular events; all sessions were supervised by a physician.

### **Potential Benefits:**

- Possible improvements in blood pressure, heart rate variability, aerobic fitness, metabolism, and sleep quality.
- Contribution to scientific knowledge that may help others in the future.

### **Confidentiality:**

- All personal information was kept confidential and securely stored.
- Data were analyzed anonymously; individual results were not publicly disclosed.

### **Voluntary Participation:**

- Participation was voluntary.
- Participants could withdraw at any time without giving a reason and without affecting their medical care.

**Communication of Study Information:**

Most participants were **not fluent in English**. All study details, including purpose, procedures, risks, benefits, and the right to withdraw, were **explained verbally in Urdu** by trained study staff.