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User & Domain Research – Compound Weightlifting Exercises

Within the fitness sphere, weightlifting is a practice that enables muscles to adapt and get stronger by using weights to increase resistance against the muscles. Furthermore, this training regimen can be made up of exercises utilizing a lot of different muscles (compounds) and specific targeted muscle exercises (isolations), both can be further categorized in two separate categories: free weights (there is no machine assisting you with form), and machine (there is a machine assisting you with form). The key differences between free weights and machines are the assistance with form, free weights require you to have proper technique and stabilization of muscle groups whereas machines properly position your body to activate the intended muscles. For beginners form and technique can be difficult to learn properly and can result in permanent to fatal injuries, thus machines are easier to initially work with but not entirely safe. According to Mazur “The greatest risk of technique-related injuries occur during aggressive use of free weights in such exercises as the dead lift and bench press (Brown & Kimball 1983; Risser et al. 1990; Zemper 1990). Injuries using weight machines are also possible (Brady et al. 1982).”, which explains that without proper technique compound lifts like the dead lift and bench press pose a higher risk of injury (Mazur et al.). The drawback of using machines is that “hypotheses [are] based on the evidence that training with free weights activates more muscle mass, which should cause a greater increase in free testosterone, and over time causes a greater increase in muscle mass and strength.” (Schwanbeck et al.). To optimally train and teach newer weightlifters proper form and range of motion, an audio-based interface that alerts the user when they are in proper start form and when the range of motion of the exercise is fully exhibited would help optimize training. Currently, the best method to learn proper range of motion on machines and compounds is to have a personal trainer or someone with enough experience to guide you, however it is not feasible for everyone to have a personal trainer due to scheduling issues, geographical complications, or financial problems, thus this interface could act as a substitute for beginners and those with less means to spend on health. To expand on this, poorer areas have less gyms and far less trainers than areas with higher incomes and being healthy is widely unconcerning as economic struggle and stress rapidly increases health issues. According to AAFP, “Poverty and low-income status are associated with various adverse health outcomes, including shorter life expectancy, higher infant mortality rates, and higher death rates for the 14 leading causes of death,” (AAFP). This highlights the problems that lower income areas face, alongside how a cheaper alternative to personal trainers can curb the neglection of health exhibited in poorer areas. To circumvent these health issues Cattell notes, “for those involved in local activities, it is clear that participation has health promoting qualities,” so engagement with the gym would lead to a better support system for poorer individual’s health (Cattell). For this interface to be successful, body position and muscle strain must be logged to measure the effectiveness of an exercise. This can notify the user of the intensity of the exercise, if muscles are properly activating, and if their form is promoting the least possible risk of injury. Bodybuilders can also suffer from lower range of movement thus the interface must be adaptable and calibrated to each person, evidence of this is clear in Barlow’s study concerning range of motion,“The results of this study have implications for body-builders, strength coaches, personal trainers, and health care providers in suggesting proper education and instruction on maintaining appropriate shoulder flexibility through performance and selection of proper resistance exercise to minimize the incidence of shoulder pathology.” as bodybuilders tend to lose range of motion due to the increased muscle mass and posterior capsule tightness (Barlow et al.). All-in-all, this interface looks to assist weightlifters of all skill levels performing machine or free weight exercise, to ensure they are doing the best possible rep with the least amount of risk of physical injury.

Works Cited

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