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國立臺灣大學 112 學年度碩士班招生考試試題

科目： 英文科學論文閱讀測驗

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【第一題，本題佔 50%】

請閱讀該文獻的摘要內容並回答問題。

Abstract

Objective: To describe the feasibility of an evidence-based physical therapy (PT) program for persons with chronic low back pain (LBP) originally designed for in-person delivery, adapted for telehealth using videoconferencing.

Design: Prospective, longitudinal cohort.

Setting: Three health care systems in the United States.

Participants: Adults, aged 18-64 years (N=126), with chronic LBP recruited from August through December 2020.

Intervention: Up to 8 weekly sessions of telehealth PT.

Main Outcome Measures: Follow-up assessments were 10 and 26 weeks after baseline. Participant outcomes collected were the Oswestry Disability Index, Patient-Reported Outcomes Measurement Information System-29 health domains, and pain self-efficacy. Implementation outcomes included acceptability, adoption, feasibility, and fidelity assessed using participant surveys and compliance with session attendance.

Results: We enrolled 126 participants (mean age, 51.5 years; 62.7% female). Baseline perceptions about telehealth were generally positive. Eighty-eight participants (69.8%) initiated telehealth PT, with a median of 5 sessions attended. Participants in telehealth PT were generally satisfied (76.3%), although only 39.5% perceived the quality equal to in-person PT. Telehealth PT participants reported significant improvement in LBP-related disability, pain intensity, pain interference, physical function, and sleep disturbance at 10- and 26-week follow-ups.

Conclusions: The findings generally support the feasibility of telehealth PT using videoconferencing. Implementation and participant outcomes were similar to in-person PT as delivered in the participating health care systems. We identified barriers that may detract from the patient experience and likelihood of benefitting from telehealth PT. More research is needed to optimize and evaluate the most effective strategies for providing telehealth PT for patients with chronic LBP.

(摘錄自 APMR 2022;103:1924-34)

1. 請簡要描述此篇研究目的? (10%)
2. 請簡述此篇研究設計? (10%)
3. 請簡述此研究的 outcome measures。 (15%)
4. 請重點整理這篇研究的結果與結論(15%)

【第二題，本題佔 20%】

請閱讀該文獻的摘要內容並回答問題。

(文章出處: Kazuhiro Hayashi, PT, PhD, Adam Janowski, PT, Joseph B Lesnak, PT, Kathleen A Sluka, PT, PhD, FAPTA, Preoperative Exercise Has a Modest Effect on Postoperative Pain, Function, Quality of Life, and Complications: A Systematic Review and Meta-Analysis, *Physical Therapy*, 2022;, pzac169, <https://doi.org/10.1093/ptj/pzac169>)

Abstract

Objective. Preoperative exercise (prehabilitation) is commonly used as a method to reduce pain and improve function postoperatively. The purpose of this systematic review was to determine therapeutic benefits of preoperative exercise on postoperative pain, function, quality of life, and risk of complications across various types of surgeries. **Methods.** Three electronic databases were used to perform a literature search. Full articles with randomized designs comparing a

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preoperative exercise program versus no formal program were included. The primary outcome was postoperative pain. Quality of life, function, and postoperative complications were analyzed as secondary outcomes. The primary meta-analysis was performed in those with joint replacement surgery as there were only 5 with other surgical types. Results: A total of 28 articles were included, of which 23 were from individuals with total joint replacement surgery. Preoperative exercise resulted in lower pain ≤ 2 months and 3 to 5 months after joint replacement surgery with a moderate standardized mean difference (SMD [95% CI] at < 2 months = -0.34 [-0.59 to -0.09]; at 3 to 5 months = -0.41 [-0.70 to -0.11]) when compared with nonexercised controls. However, ≥ 6 months after joint replacement surgery, preoperative exercise groups showed no significant differences in postoperative pain (SMD = -0.17 [-0.35 to 0.01]) when compared with nonexercised controls. Quality of life and subjective and objective function were improved ≤ 2 months after joint replacement surgery, but were not different ≥ 6 months postsurgery. Reduction in risk of postoperative complications was favored with preoperative exercise. Conclusions. Preoperative exercise has a modest effect on postoperative pain, function, quality of life within the first 6 months after surgery and reduces the risk of developing postoperative complications in individuals undergoing joint replacement surgery. The effect of preoperative exercise on other surgery types is inconclusive. Impact. This systematic review supports using preoperative exercise to improve pain and function outcomes for those with joint replacement surgery

1. 請問此篇研究是屬於哪種類型的研究? (5%)，請簡要描述此篇研究目的? (5%)
2. 請重點整理這篇研究的重要結果? (5%)，此研究對臨床有何重要性? (5%)

【第三題，本題佔 30%】

請閱讀該英文報導的內容並回答問題。

<以下文章節錄自 Voice of American, Learning English, <https://learningenglish.voanews.com/p/5610.html>>

More scientists are exploring cellular senescence -- a state in which cells no longer divide. Senescent cells, which build up in older bodies, have a link to age-related conditions such as dementia and cardiovascular disease. Scientists are exploring drugs that target senescent cells. But the most promising tool against the negative effects of senescent cells, experts say, is exercise.

"A very hot topic" Viviana Perez Montes of the National Institutes of Health described cellular senescence as "a very hot topic." The Associated Press reports that about 11,500 projects involving cellular senescence have begun since 1985. The AP report was based on its study of an NIH research database. A large number of the projects began in recent years, the report said. Such research is built upon the idea that cells stop dividing and enter a "senescent" state in reaction to damage. The body expels most of these cells. But others remain in the body. They can harm nearby cells, says Mayo Clinic's Nathan LeBrasseur. He compared it to the way one bad fruit can ruin a container full of fruit. But scientists wonder: Can the unhealthy buildup of senescent cells be stopped? "The ability to understand aging ... is truly the greatest **opportunity** we have had, maybe in history, to **transform** human health," LeBrasseur says. Extending the healthy years affects "quality of life" and "public health," he said. The number of people 65 or older is expected to double around the world by 2050. Although no one thinks senescence holds the key to extremely long life, Tufts University researcher Christopher Wiley hopes for a day when fewer people suffer like his grandfather did before death. He had Alzheimer's disease. "I'm not looking for the **fountain of youth**," Wiley says. "I'm looking for the fountain of not being sick when I'm older."

Drugs

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About 100 companies, plus academic groups, are exploring drugs to target senescent cells. Scientists are careful to note that cell senescence can be useful. The process probably developed at least in part to suppress the development of cancer. Cell senescence happens throughout our lives, caused by things like DNA damage and the shortening of telomeres, structures that protect the ends of chromosomes. Senescent cells play a role in wound healing, embryonic development and childbirth. But problems can come up when senescent cells build up. "When you're young, your immune system is able to recognize these senescent cells and eliminate them," says Perez, who studies cell biology and aging. But, when we start getting old, in Perez's words, "the activity of our immune system also gets **diminished**, so we're losing the **capacity** to eliminate them. "Experimental drugs designed to clear senescent cells have been called "senolytics." In mice, they have been shown to be effective at delaying, preventing or easing several age-related disorders. At least 12 **clinical** trials with senolytics are now testing whether the drugs can help control Alzheimer's, improve skeletal health and more. There is still much to learn.

Exercise

Today, LeBrasseur, who directs a center on aging at Mayo, says exercise is "the most promising tool that we have" for good health in late life, and its power extends to our cells. Research suggests exercise counters the buildup of senescent cells, helping the immune system clear them and fight the molecular damage that can affect the senescence process. Last year, LeBrasseur led a study that provided the first evidence in humans that exercise substantially affected the process. It reduced signs in the bloodstream of the effects of senescent cells in the body. After a 12-week exercise program, researchers found that older adults had decreased signs of senescence and improved muscle strength, physical ability and reported health. A recently-published research review collects even more evidence — in animals and humans — for exercise as a senescence-targeting therapy. While such studies are not well-known outside scientific circles, many older adults connect exercise with youthfulness.

Rancher Mike Gale, 81, put in a track and field throwing circle on his large property in California. He and some of his friends throw the discus and use other exercise equipment.

"I'd like to be competing in my 90s," Gale says. "Why not?"

95-year-old Richard Soller says exercise keeps him fit enough to deal with what comes his way — including the discovery that his wife of 62 years had developed Alzheimer's. The two sometimes walk the streets of their neighborhood together, holding hands. "Do as much as you can," he says. "That should be the goal for anyone to stay healthy."

1. 根據文章的描述，請問何謂"cellular senescence"? 請說明其意義及用處。(10%)
2. 請簡要說明文章內有提到的實驗或研究內容。(10%)
3. 請說明文章內提到的 "fountain of youth" 和 "fountain of not being sick" 意義上有何不同?(5%)
4. 請為此篇文章想一個合適貼切的英文題目。(5%)

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