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How Orthopedic Surgeons View Open Label Placebo Pills – A Pilot Study: Ethical and Effective, but Opposed to Personal Use --Manuscript Draft--

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Abstract:	<p>Objective: To examine attitudes of Open Label Placebos (OLP) among a national sample of US orthopedic surgeons.</p> <p>Methods: Orthopedic surgeons across the US were invited to participate in a brief online cross-sectional survey; n=687 participated. The survey included a short vignette of a surgeon using adjunctive OLPs in addition to opioids for postoperative pain management. Participants indicated how ethical and effective they thought OLPs would be in this context, and whether they would personally consider using OLPs.</p> <p>Results: Nearly three-quarters (73.9%) of the surgeons considered OLPs ethical. In total, around half of the participants said that OLPs would “probably” or “definitely” be effective for Vicodin reduction (55.4% of sample) and pain relief (48.8% of sample). However, only 19.2% of participants indicated they were personally willing to consider OLPs, and 59.6% were unwilling to do so.</p> <p>Conclusions: Generally, orthopedic surgeons in America perceive OLPs as both ethical and effective, but would not consider using them in their practice. Further research is needed to identify clinician barriers to OLP use.</p>
Response to Reviewers:	Please see the attached document

Highlights

- Approximately 3 in 4 **U.S.** orthopedic surgeons think Open Label Placebos are ethical
- Approximately 1 in 2 **U.S.** orthopedic surgeons think Open Label Placebos would be effective
- Only 19% of orthopedic surgeons would consider using Open Label Placebos

Abstract

Objective: To examine attitudes of Open Label Placebos (OLP) among a national sample of US orthopedic surgeons.

Methods: Orthopedic surgeons across the US were invited to participate in a brief online cross-sectional survey; n=687 participated. The survey included a short vignette of a surgeon using adjunctive OLPs in addition to opioids for postoperative pain management. Participants indicated how ethical and effective they thought OLPs would be in this context, and whether they would personally consider using OLPs.

Results: Nearly three-quarters (73.9%) of the surgeons considered OLPs ethical. In total, around half of the participants said that OLPs would “probably” or “definitely” be effective for Vicodin reduction (55.4% of sample) and pain relief (48.8% of sample). However, only 19.2% of participants indicated they were personally willing to consider OLPs, and 59.6% were unwilling to do so.

Conclusions: Generally, orthopedic surgeons in America perceive OLPs as both ethical and effective, but would not consider using them in their practice. Further research is needed to identify clinician barriers to OLP use.

Key words: Placebo, Opioid, Pain, Pain reduction, Open Label Placebo

How Orthopedic Surgeons View Open Label Placebo **Pills: Ethical and Effective, but Opposed to Personal Use**

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Declaration of Interests: None

Introduction

Since 2010 the number of opioid overdose deaths in the US has more than tripled, reaching approximately 70,000 in 2020 (1, 2). More than 1/3 of the American population report prescription opioid use annually (3). Since prescription opioids have contributed to the opioid crisis (4), non-addictive pain management alternatives are needed.

Open Label Placebos (OLPs) for Pain Management

Randomized clinical trials have shown that, when compared to treatment as usual, honest, or open-labeled placebos (OLPs) used alone or in combination with opioids promote greater analgesia for conditions such as chronic lower back pain (5, 6), and spinal cord injury and polytrauma (7). One recent meta-analysis of 11 RCTs found that the overall effect size of symptom improvement with OLP was a standardized mean difference of 0.72 (8). Within the surgery setting, Flowers et al. (9) randomized 41 patients to a Treatment as Usual (TAU) condition or to an OLP condition for post-operative pain from spine surgery. Over the course of 17 days, patients in the OLP condition reported less pain and took fewer opioids than those in TAU.

Pain & Placebo Effects in the Orthopedic Setting

Orthopedic surgery represents a promising opportunity for OLP use. Pain is often experienced after orthopedic procedures (10). While orthopedic surgery is the fourth-most common medical field where opioids are prescribed (11), fewer opioids are needed for post-operative pain management than are typically given to patients (12).

Placebo effects feature prominently in the orthopedic setting. In a review of RCTs where a real orthopedic procedure was compared to a sham procedure, there was no difference between conditions in any of the outcomes for five of the six trials (13). A meta-analysis observed that

78% of the improvement in pain for real surgery is duplicated by a sham surgery (14).

Regarding open placebos, a prior study in the UK found that 97.8% of orthopedic trainees thought OLPs were at least sometimes permitted in clinical practice (15). Additional strategies for post-operative pain management in this setting are needed (16) to minimize the risk of perioperative opioid use and long-term opioid use disorder (17). OLPs could potentially be added to multimodality pain management strategies. **The aim of the present study was to evaluate if orthopedic surgeons in the U.S. view OLPs as ethical and effective.**

Methods

Recruitment and Procedure

Participants were recruited based on a national listing of orthopedic surgeons in the United States through drbill.com. Three recruitment emails were sent to 15,700 orthopedic surgeons in September 2020 eliciting their participation in an 8-minute survey. A total of 687 surgeons (4.4%) provided informed consent (displayed on the first page) and participated in the study. All procedures were approved by the Brown University IRB (**protocol 2007002753**).

Participants did not receive compensation.

Survey

Current use of modifying expectations (Item 1) was assessed by asking “How often do you try to enhance a patient’s belief in a treatment in an attempt to make the treatment more successful?” (1 = almost never or never to 5 = almost always or always).

Next, participants were given a vignette (Appendix A) describing OLP offered by a hypothetical physician (Dr. Smith) to a patient recovering from a minor surgery. The vignette is based on the manner in which OLPs were administered in an earlier study with hand surgery patients (18).

OLP efficacy (Items 2-4) was assessed with three items: “Do you think the placebos Dr. Smith gave could be effective for pain management?” (1 = definitely not to 5 = definitely yes); “Do you think the placebos Dr. Smith gave could be effective for reducing Vicodin use? (1=definitely not to 5=definitely yes); “For what percentage of your patients do you think this would be effective?” (enter a whole number 0-100). OLP ethics (Item 5) was assessed with: “Do you think what Dr. Smith did is ethical?” (yes, no, unsure). Willingness to use OLPs (Item 6) was assessed with “Would you ever consider giving placebos in the manner Dr. Smith did?” (yes, no, unsure).

Data analysis

Data were analyzed using descriptive statistics. Group comparisons were made using the Wilcoxon test since data were ordinal.

Results

Participant Demographics

Participants were predominantly male (92.8%), White/Caucasian (87.3%) and in private practice (60.4%). The average age was 57.4 ($SD=11.62$) years old and surgeons performed an average of 8.5 surgeries/week. The most common specialties were Sports Medicine (18.7%), Joint Replacement (17.5%), and Hand Surgery (11.8%).

Current Use of Modifying Expectations (Item 1)

In total, 77.5% of participants at least occasionally tried to enhance patient expectations: 22.5% said “almost never or never”, while 14.4%, 21.6%, 26.0%, and 15.5% responded with “occasionally”, “sometimes”, “often” and “almost always or always”, respectively.

Beliefs about OLP Efficacy (Items 2-4)

Approximately ½ of participants reported OLPs would “probably” or “definitely” reduce Vicodin use and relieve pain (55.8% and 48.8%, respectively). Frequencies are displayed in Table 1. Participants were more optimistic about the efficacy of OLP for Vicodin reduction vs. pain relief, Wilcoxon $Z=-6.03$, $p<.001$. On average, participants reported that OLPs would be effective for 22.7% ($SD=21.3\%$; $Mdn=20.0\%$) of patients.

Table 1. Attitudes towards OLP efficacy for Vicodin use reduction and pain relief

Response option	Vicodin Reduction (%)	Pain Relief (%)
Definitely not	2.0	2.7
Probably not	17.9	25.5
Unsure	24.4	23.0
Probably yes	50.4	44.0
Definitely yes	5.4	4.8

Notes: Response frequencies are displayed for the two items that assess whether OLPs would be effective for reducing Vicodin use and relieving pain.

Beliefs about OLP Ethics & Willingness to use OLPs (Items 5-6)

In total, 73.9% of participants reported that using OLPs in the manner described was ethical, while 14.7% and 11.5% said “no” and “unsure”, respectively. Only 19.2% reported that they would ever consider giving OLPs in the manner described, while 59.6% said they would not consider it, and 21.2% were unsure. See Table 2.

Table 2. Beliefs about OLP ethics and personal willingness to use OLPs

Response option	OLP Ethical?	Give OLP?
Yes	73.9	19.2
No	14.7	59.6
Unsure	11.5	21.2

Notes. Response frequencies are displayed for the two items that assess whether OLPs are ethical and whether participants would be willing to give OLPs.

Discussion

Orthopedic surgeons generally viewed OLPs as both ethical and effective; 74% considered that OLPs, prescribed in the manner described in the vignette, are ethical. Approximately half of participants predicted they **could** be effective for analgesia (48.8%) or

opioid use reduction (55.8%). While both values are moderate to high, it should be noted that the perceived potential efficacy of OLPs for opioid use reduction was statistically larger than for analgesia. Given the harms associated with opioid use (19), and the general role of prescription opioids in the opioid crisis (4, 19), the fact that a majority of surgeons in the U.S. think OLPs could be opioid sparing is noteworthy.

In spite of these positive attitudes toward OLPs, relatively few participants reported a willingness to use them (only 19.2% said yes, and 21.2% were unsure). Presumably the majority of participants perceive barriers to the clinical application of OLPs that are unrelated to ethics or efficacy. Possibilities include: a fear of legal or reputational repercussions, institutional barriers, a perceived inappropriateness of providing placebos, logistical concerns (e.g. time constraints, obtaining placebo pills), and inertia. Some of these barriers were observed in a recent focus group study among primary care providers (20) and may apply to specialists such as orthopedic surgeons. Alternatively, physicians may only be willing to consider OLPs if they have a high belief about their efficacy. While approximately half of the participants thought OLPs would relieve pain, this also means that about half the sample thought it would not promote analgesia or were unsure.

Strengths and Limitations

The primary strength is that we sampled a relatively large group of surgeons who were recruited across the U.S. The primary limitation was a low response rate (4.4%). While this raises concern about responder bias, demographic data from the sample were similar to data from the American Academy of Orthopaedic Surgeon's 2018 census (Age: sample $M=57.4$, census $M=56.5$; Gender: sample=92.8% male, census=92.3% male; Race: sample=87.3% White, census=84.7% White). Additionally, current opioid prescribing practices were not assessed, the

ethics of OLPs were measured with discrete yes/no/maybe options **which limits sensitivity**, and OLP attitudes were captured from a single vignette. Regarding this final point, while we felt it was necessary to anchor participants to a specific potential use of OLPs, attitudes may differ in other contexts. **Finally, the item assessing whether OLPs could reduce Vicodin use may have been interpreted by some surgeons as also assessing its analgesic properties, similar to the previous question.**

Future Directions

Future studies should examine physician barriers to clinical use of OLPs, and patient attitudes towards taking open placebos (21). **Attitudes towards OLP pills were assessed in the present study, but other possibilities also exist that warrant future study such as OLP topical creams (see (22)) or intravenous injections.** Also, although OLPs are substantially more effective than no-treatment conditions (8), studies should examine long-term OLP effects, and consider utilizing more robust control groups to disentangle what aspects of OLP (e.g. the pill, the rationale) are effective (23). If the evidence regarding OLP efficacy remains convincing, **their use** could be added to pain management curricula in medical education. Researchers might consider creating an instructional video on OLPs for trainees. **OLP attitudes among other specialists should also be investigated.**

Conclusions

When presented with a vignette describing adjunctive OLPs, most **American** orthopedic surgeons believed that OLPs were ethical, and around half thought it would be effective for analgesia and opioid use reduction. While these results are promising about the potential role of OLPs in reducing opioid use, the majority of surgeons indicated they would not consider using them.

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Appendix A

After a minor orthopedic surgery, Dr. Smith prescribes Vicodin and gives a bottle filled with sugar pills (placebos) to a patient. He **honestly informs the patient** that the placebo pills are inactive and do not contain any real medicine. The patient is **never deceived** and knows which pills are Vicodin and which pills are placebos.

Dr. Smith tells the patient that the placebo effect is powerful and can be Pavlovian classically conditioned. As such, she should take one placebo each time she takes a Vicodin. Dr. Smith also says that at a certain point she may get adequate pain relief from the placebo without also taking a Vicodin. Thus, Dr. Smith says that the patient may wish to consider taking a placebo alone (without a Vicodin) for some doses.

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How Orthopedic Surgeons View Open Label Placebo: Ethical and Effective, but Opposed to Personal Use

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Introduction

Over the past decade, the number of opioid overdose deaths have more than doubled, reaching nearly 50,000 in 2019 (1). As of 2015, the annual cost of the opioid crisis was estimated to be 504 billion dollars (2). Though data are still preliminary, some research suggests that opioid use has been further exacerbated during COVID-19 (3). More than 1/3 of the population report prescription opioid use annually (4). Opioid mortality has increased in tandem with opioid prescribing, and heroin initiation is often preceded by nonmedical prescription opioid use (5, 6). Since prescription opioids have contributed to the opioid crisis (7), non-addictive pain management alternatives are needed for pain management.

Open Label Placebos (OLPs) for Pain Management

Randomized studies suggest that honest, or open-label placebos (OLPs) may be effective for pain induced in the laboratory. Three recent studies reported that OLPs reduce acute pain relative to no treatment (8-10). In one of these studies, pain scores were 21% lower on the trials when a participant received a placebo while told “I will now inject a placebo in your vein... [A] placebo does not contain any active medical component” compared to trials with no treatment (10). Locher and colleagues (11) did not find a statistically significant difference on pain intensity between OLPs delivered with a rationale compared to no treatment, though results trended in the direction of improved outcomes in the OLP condition.

Recent work also suggests that OLPs may reduce symptoms for pain or other conditions in a clinical population (12-15). Randomized clinical trials have shown that, when compared to treatment as usual, OLPs used alone or in combination with opioids promote greater analgesia for conditions such as chronic lower back pain (16, 17), and spinal cord injury and polytrauma (18). One recent meta-analysis of 11 RCTs found that the overall effect size of symptom

improvement with OLP was a standardized mean difference of 0.72 (15). Within the surgery setting, Flowers et al. (19) randomized 41 patients to a Treatment as Usual (TAU) condition or to an OLP condition for treating post-operative pain from spine surgery. Patients in the OLP group were asked to pair opioid medication with an honest placebo, and also take 3 un-paired honest placebos daily. Over the course of 14 days, patients in the OLP condition reported less average daily pain, lower worst daily pain, and took fewer opioids than those in TAU.

Pain & Placebo Effects in the Orthopedic Setting

Orthopedic surgery represents a promising option for OLP use. Pain is often experienced after orthopedic procedures (20). While orthopedic surgery is the fourth-most common medical field where opioids are prescribed (21), fewer opioids are needed for post-operative pain management than are given to patients (22).

Though it has typically been examined in the context of surgery, placebo effects feature prominently in the orthopedic setting. In a review of six RCTs where a real orthopedic procedure was compared to a sham, there was no difference between conditions in any of the outcomes for five of the trials (23). This result is consistent with a meta-analysis that observed that 78% of the improvement in pain for real surgery is duplicated by a sham surgery (24). Regarding open placebos specifically, a prior study in the UK found that 97.8% of orthopedic trainees thought OLPs were at least sometimes permitted in clinical practice, and 88% believed that placebos had a therapeutic benefit (25). Additional strategies for post-operative pain management in this setting are needed (26) to minimize the risk of perioperative opioid use and long-term opioid use disorder (27). OLPs could potentially be added to multimodality pain management strategies. We have previously established the acceptability of OLPs among orthopedic patients, where 10/11 patients who had a hand surgery did not express ethical concerns regarding OLPs (28), consistent

with earlier studies on open placebo attitudes among patients (29). The objective of this study was to evaluate U.S. orthopedic surgeon's attitudes and beliefs regarding OLPs.

Methods

Recruitment and Procedure

Participants were recruited based on a national listing of orthopedic surgeons in the United States through drbill.com. In total, three recruitment emails were sent to 15,700 orthopedic surgeons in September 2020 eliciting their participation in an 8-minute survey. Approximately 7% of emails were undelivered by Mailchimp. No compensation was offered. A survey link to a Qualtrics questionnaire was embedded in the survey. A total of 948 people clicked the link, and 687 surgeons (4.4%) provided informed consent (displayed on the first page) and participated in the study. All procedures were approved by the Brown University IRB.

Survey

Current use of modifying expectations (Item 1) was assessed by asking "How often do you try to enhance a patient's belief in a treatment in an attempt to make the treatment more successful?" (1 = almost never or never to 5 = almost always or always).

Participants were given the following vignette describing OLP. The vignette is based on the manner in which OLPs were administered in an earlier study with hand surgery patients (30).

After a minor orthopedic surgery, Dr. Smith prescribes Vicodin and gives a bottle filled with sugar pills (placebos) to a patient. He **honestly informs the patient** that the placebo pills are inactive and do not contain any real medicine. The patient is **never deceived** and knows which pills are Vicodin and which pills are placebos.

Dr. Smith tells the patient that the placebo effect is powerful and can be Pavlovian classically conditioned. As such, she should take one placebo each time she takes a Vicodin. Dr. Smith also says that at a certain point she may get adequate pain relief from the placebo without also taking a Vicodin. Thus, Dr. Smith says that the patient may wish to consider taking a placebo alone (without a Vicodin) for some doses.

OLP efficacy (Items 2-4) were assessed with three items: "Do you think the placebos Dr. Smith gave could be effective for pain management?" (1 = definitely not to 5 = definitely yes);

“Do you think the placebos Dr. Smith gave could be effective for reducing Vicodin use? (1=definitely not to 5=definitely yes); “For what percentage of your patients do you think this would be effective? (enter a whole number 0-100)”

OLP ethics (Item 5) were assessed with: “Do you think what Dr. Smith did is ethical?” (yes, no, unsure).

Willingness to use OLPs (Item 6) was assessed with “Would you ever consider giving placebos in the manner Dr. Smith did?” (yes, no, unsure).

Data analysis

Data were analyzed using descriptive statistics. All inferential statistics were run using non-parametric tests (e.g Spearman’s rho) since data were ordinal rather than continuous. When using non-parametric tests, items 2 and 5 were recoded to 1=no, 2=unsure, 3=yes.

Results

Participant Demographics

Participants were predominantly male (92.8%), White/Caucasian (87.3%) and in private practice (60.4%). The average age was 57.4 (*SD*=11.62) years old and surgeons performed an average of 8.5 surgeries/week. The most common specialties were Sports Medicine (18.7%), Joint Replacement (17.5%), and Hand Surgery (11.8%).

Current Use of Modifying Expectations (Item 1)

In total, 77.5% of participants at least occasionally tried to enhance patient expectations: 22.5% said “almost never or never”, while 14.4%, 21.6%, 26.0%, and 15.5% responded with “occasionally”, “sometimes”, “often” and “almost always or always”, respectively.

Beliefs about OLP Efficacy (Items 2-4)

Approximately ½ of participants reported OLPs would “probably” or “definitely” reduce Vicodin use and relieve pain (55.8% and 48.8%, respectively). Frequencies are displayed in

Table 1. Participants were more optimistic about the efficacy of OLP for Vicodin reduction vs. pain relief, Wilcoxon $Z=-6.03$, $p<.001$. On average, participants reported that OLPs would be effective for 22.7% ($SD=21.3\%$; $Mdn=20.0\%$) of patients.

Table 1. Attitudes towards OLP efficacy for Vicodin use reduction and pain relief

Response option	Vicodin Reduction (%)	Pain Relief (%)
Definitely not	2.0	2.7
Probably not	17.9	25.5
Unsure	24.4	23.0
Probably yes	50.4	44.0
Definitely yes	5.4	4.8

Notes: Response frequencies are displayed for the two items that assess whether OLPs would be effective for reducing Vicodin use and relieving pain.

Beliefs about OLP Ethics & Willingness to use OLPs (Items 5-6)

In total, 73.9% of participants reported that using OLPs in the manner described was ethical, while 14.7% and 11.5% said “no” and “unsure”, respectively. On the other hand, only 19.2% reported that they would ever consider giving OLPs in the manner described, while 59.6% said they would not consider it, and 21.2% were unsure. See Table 2.

Table 2. Beliefs about OLP ethics and personal willingness to use OLPs

Response option	OLP Ethical?	Give OLP?
Yes	73.9	19.2
No	14.7	59.6
Unsure	11.5	21.2

Notes. Response frequencies are displayed for the two items that assess whether OLPs are ethical and whether participants would be willing to give OLPs.

Relationship between variables of interest

Table 3 displays the correlation (Spearman’s rho) between study variables. The number of years the participant has been a doctor is also included to examine potential differences according to experience. Current use of expectations, willingness to use OLPs, the ethics of OLPs (high scores=more ethical), and OLP efficacy for pain and Vicodin reduction all had positive inter-correlations. More experienced doctors had more negative attitudes towards

personally using OLPs ($\rho=-.174$), viewing OLPs as ethical ($\rho=-.111$), and thinking OLPs are effective ($\rho=-.147$ and $-.197$ for pain and Vicodin, respectively).

Table 3. Correlations between study variables.

	1	2	3	4	5	6
1) Expectations	-					
2) Use OLP	.108**	-				
3) Ethics of OLP	.126**	.353***	-			
4) OLP Effectiveness: Pain	.094*	.450***	.362***	-		
5) OLP Effectiveness: Vicodin	.080*	.432***	.331***	.718***	-	
6) Years Doc	-.038	-.174***	-.111**	-.147***	-.197***	-

Notes. Spearman's rho correlation co-efficient are displayed. 1) refers to participant's current use of expectations, 2) refers to participant's willingness to use OLPs personally, 3) refers to the perceived ethics of OLP, 4) and 5) refer to the perceived effectiveness of OLPs for pain reduction and Vicodin reduction, respectively, and 6) refers to the number of years the participant has been a doctor. * $p<.05$, two-tailed ** $p<.01$, two-tailed *** $p<.001$, two-tailed.

Discussion

In the present study, orthopedic surgeons generally viewed OLPs as both ethical and effective. In particular, 74% considered that OLPs, prescribed in the manner described in the vignette, would be ethical. Additionally, approximately half of participants predicted they would be effective for analgesia (48.8%) or opioid use reduction (55.8%). Given the harms associated with opioid use (31), and the general role of prescription opioids in the opioid crisis (7, 31), the fact that a majority of surgeons think OLPs could be opioid sparing is noteworthy.

In spite of these positive attitudes toward OLPs, relatively few participants reported a willingness to use them (only 19.2% said yes, and 21.2% were unsure). Presumably the majority of participants perceive barriers to the clinical application of OLPs that are unrelated to ethics or efficacy. Possibilities include: a fear of legal or reputational repercussions, institutional barriers, a perceived inappropriateness of providing placebos even when they might work, logistical concerns (e.g. time constraints, obtaining placebo pills), and inertia. Some of these barriers were observed in a recent focus group study among primary care providers (32) and may apply to specialists such as orthopedic surgeons.

Unsurprisingly, surgeons who were more willing to personally use OLPs thought that OLPs were more ethical and more effective. Additionally, more junior physicians expressed greater optimism regarding both the ethics and effectiveness of OLPs. This suggests that as the younger cohort of physicians gains professional influence, OLPs have a greater opportunity for clinical use.

Strengths and Limitations

The primary strength is that we sampled a relatively large group of surgeons across the entire country. The primary limitation of this study was a low response (4.4%). While this raises concern about responder bias, it should be noted that demographic data from the sample were similar to data obtained from the American Academy of Orthopaedic Surgeon's 2018 census (Age: sample $M=57.4$, census $M=56.5$; Gender: sample=92.8% male, census=92.3% male; Race: sample=87.3% White, census=84.7% White). Recruitment emails also did state placebo or placebo effects specifically. Additionally, current opioid prescribing practices were not assessed, the ethics of OLPs were measured with discrete yes/no/maybe options, and OLP attitudes were captured from a single vignette where participants were presumably exposed to the concept of open placebos for the first time. Regarding this final point, while we felt it was necessary to anchor participants to a specific potential use of OLPs, attitudes may differ in other contexts.

Future Directions

Future studies should examine physician barriers to clinical use of OLPs, and patient attitudes towards taking open placebos (28). Also, although OLPs are substantially more effective than no-treatment conditions (15), studies should examine long-term OLP effects, and consider utilizing more robust control groups to disentangle what aspects of OLP (e.g. the pill, the rationale) are effective (14). If the evidence regarding OLP efficacy remains convincing, the

use of placebos could be added to pain management curricula in medical education. Researchers might consider creating an instructional video on OLPs for trainees.

This study raises social and ethical considerations that warrant further scrutiny. While participants in the present study generally viewed OLPs as safe and effective, they were unwilling to use them personally. As discussed elsewhere (33, 34), it will be important to understand the acceptability of OLPs among different patient populations, including the effects on patient trust in clinicians, and the potential for adverse effects if patients perceive the treatment to be ineffective.

Conclusions

When presented with a vignette describing adjunctive OLPs, most orthopedic surgeons believed that OLPs were ethical, and around half thought it would be effective for analgesia and opioid use reduction. While these results are promising about the potential role of OLPs in reducing opioid use, the majority of surgeons indicated they would not consider using them. Work is needed to further establish the efficacy of OLPs and examine physician barriers.

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