

# Can **swallowable gum** improve **oral hygiene** in **developing countries?**

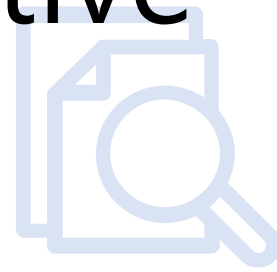


4 Ito Iwasaki Koba Mizoguchi

※ swallowable 飲み込む

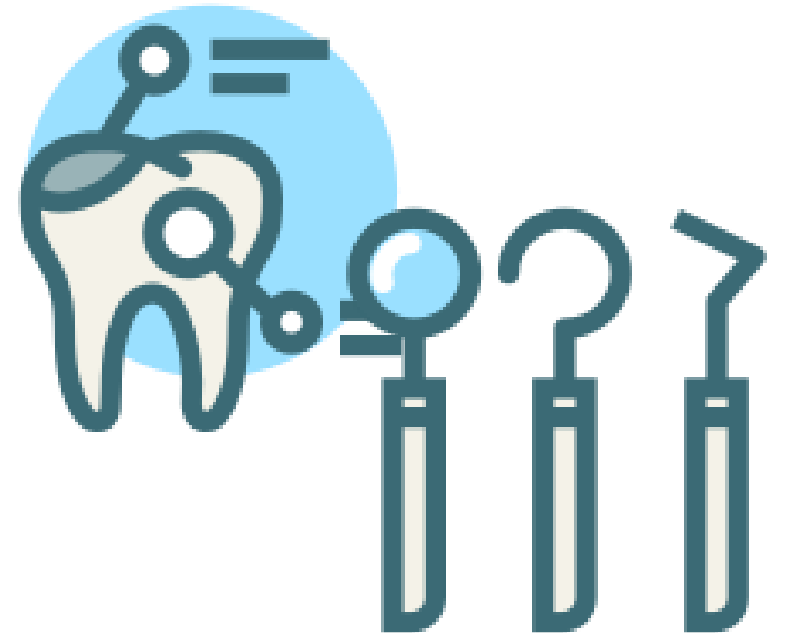
oral hygiene 口腔環境

1. Background & Objective



2. Methodology

3. Results & Discussion



4. Conclusion

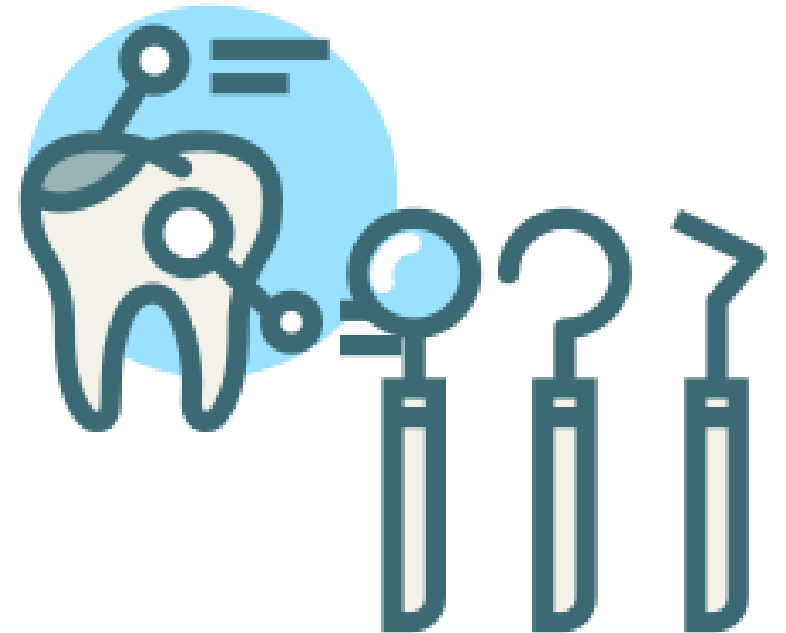
# 1. Background & Objective



2. Methodology


3. Results & Discussion

4. Conclusion



# 1. Background & Objective

※ Oral hygiene  
口腔環境



**Oral care is  
important!!**

Having good oral care is important for  
the overall health of the whole body.

# 1. Background Objective

**Water Shortage**



**People in developing countries**



**Difficult to brush their teeth**

**at 6 L)**

# 1. Background & Objective

## OBJECTIVE

**To improve oral hygiene  
in developing countries**

# 1. Background & Objective

Problems about **oral hygiene**

※ Oral hygiene 口腔環境



WHY

**Water Shortage**



Develop and spread oral care with less water

# 1. Background & Objective

## Oral Care with less Water

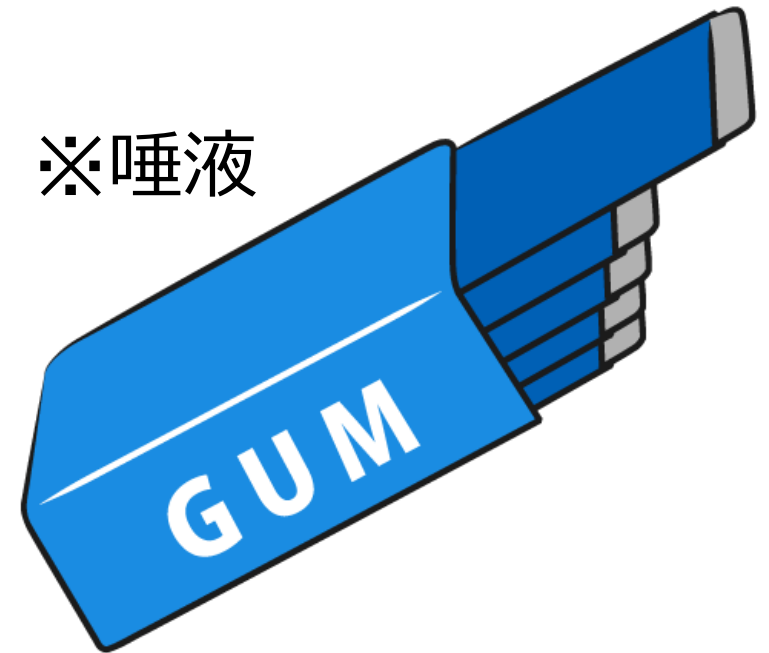
**Gum** works well

- remove **plaque** ※歯垢
- increase the amount of **saliva** ※唾液

↓ **safer**

**Swallowable gum**

※ 飲み込める





# 1. Background & Objective

## **Research Questions**

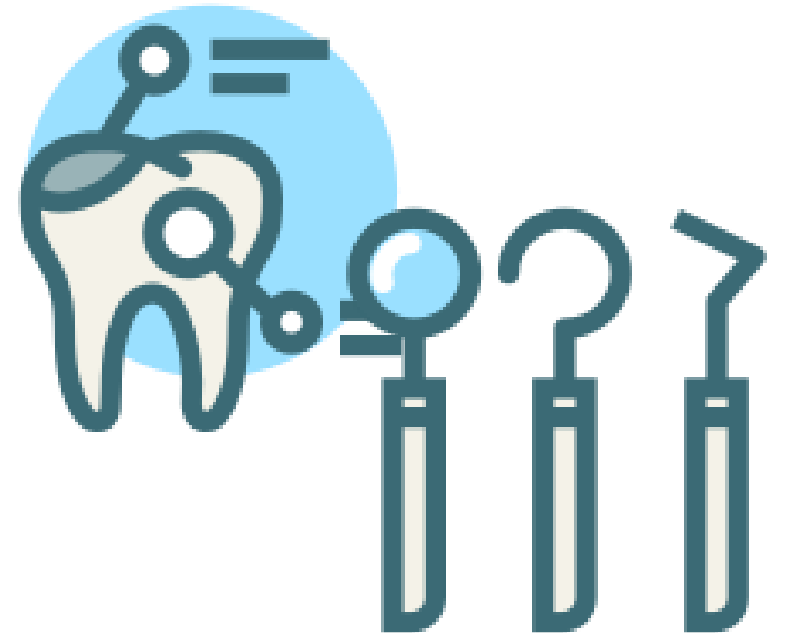
- (1) Does making gum need less water than brushing teeth?**
- (2) Can the swallowable gum remove as much plaque as store-bought gum?**
- (3) Can the swallowable gum increase the amount of saliva to the ideal amount?**
- (4) How to spread the information of the gum to developing countries.**

1. Background & Objective



## **2. Methodology**

3. Results & Discussion



4. Conclusion

## 2. Methodology

(1) Does making gum need less water than brushing teeth?

### <How to make the swallowable gum>

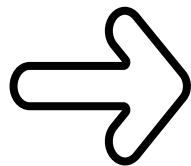
Ingredients

- Bread Flour 50g ※強力粉
- Water 20cc

①



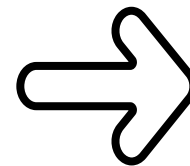
Mix bread flour and water



②



Let it rest in a plastic bag



③



Wash it

## 2. Methodology

(1) Does making gum need less water than brushing teeth?

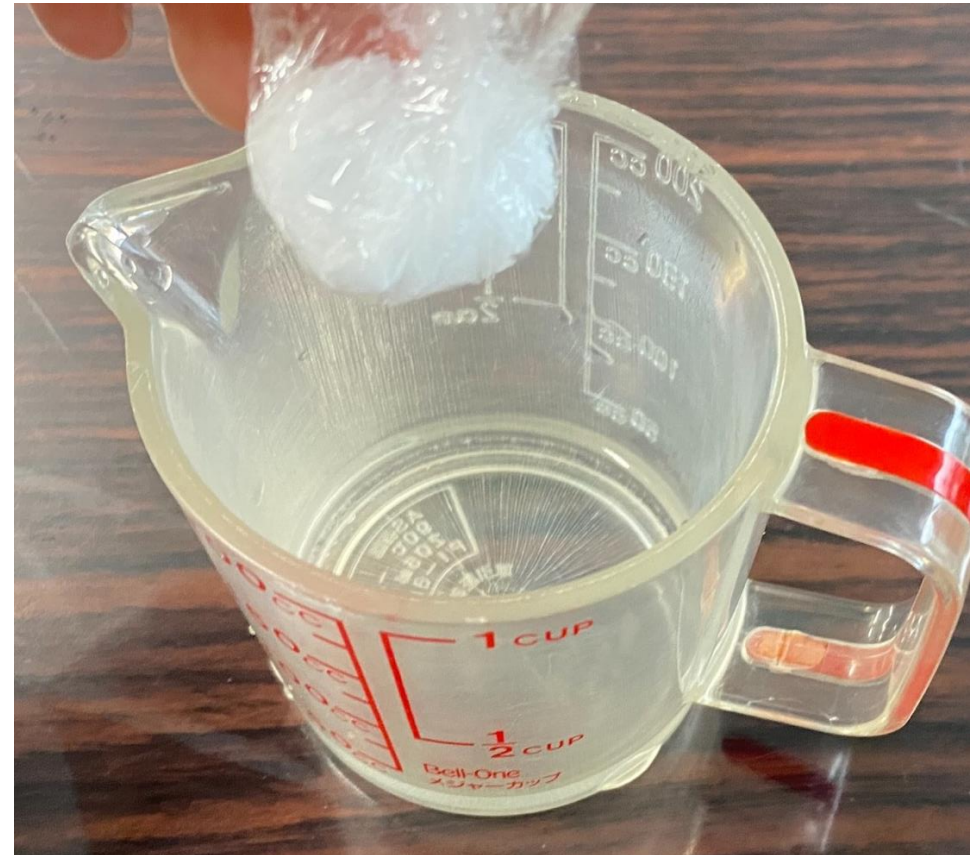
### The different point

Add 4 grams of **salt**



Increases **elasticity**

※ elasticity 弾力性



## 2. Methodology

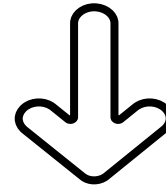
(2) Can the swallowable gum remove as much plaque as store-bought gum?

※ store-bought 市販の

### Plaque Checker



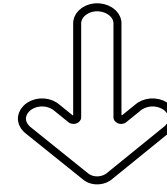
Plaque



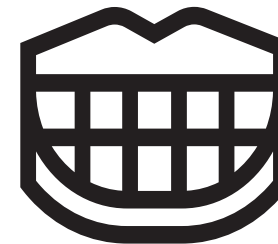
Teeth turn **RED**



No Plaque

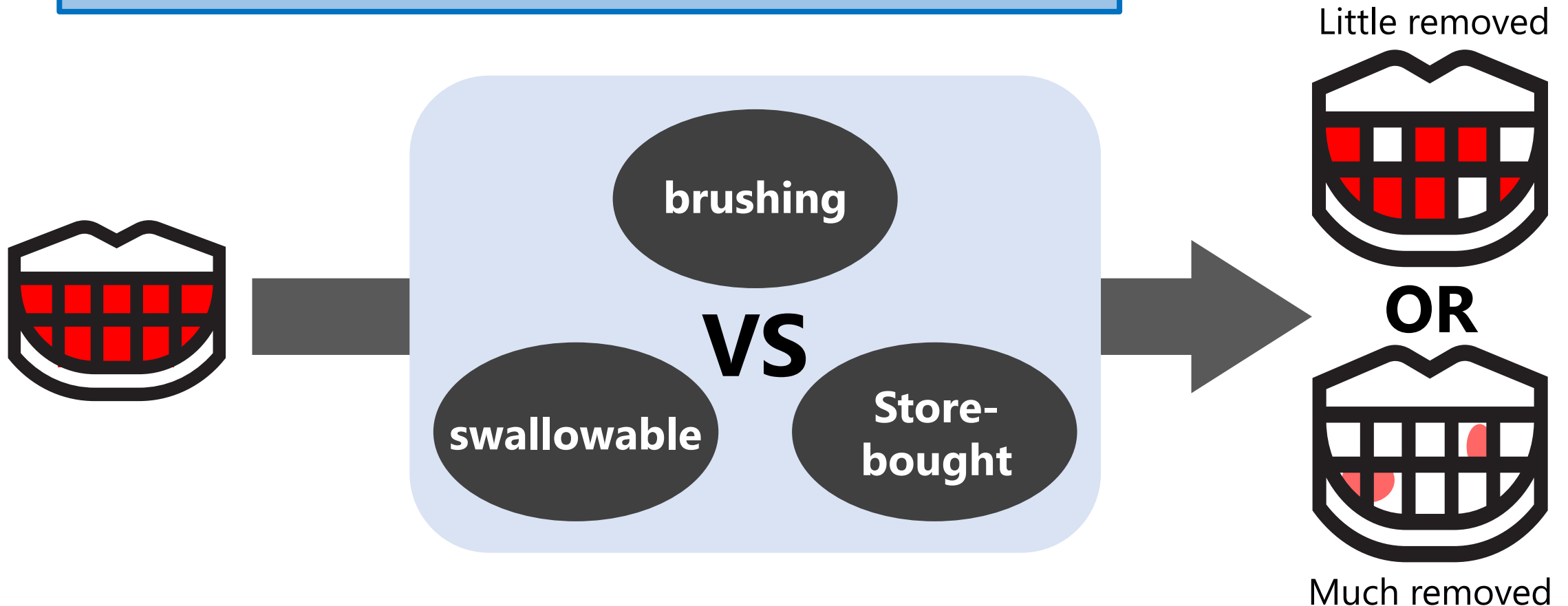


No color change



## 2. Methodology

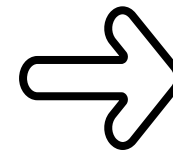
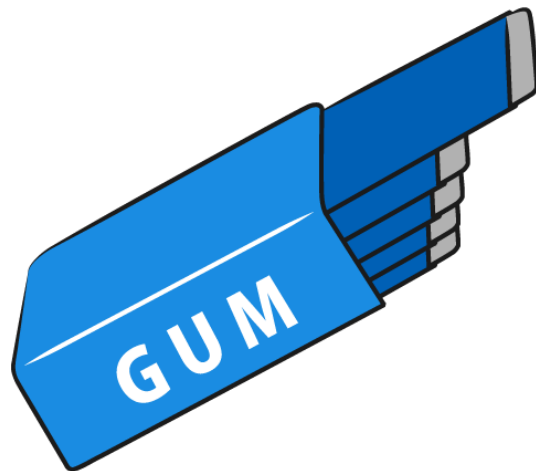
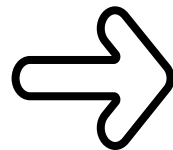
(2) Can the swallowable gum remove as much plaque as store-bought gum?



## 2. Methodology

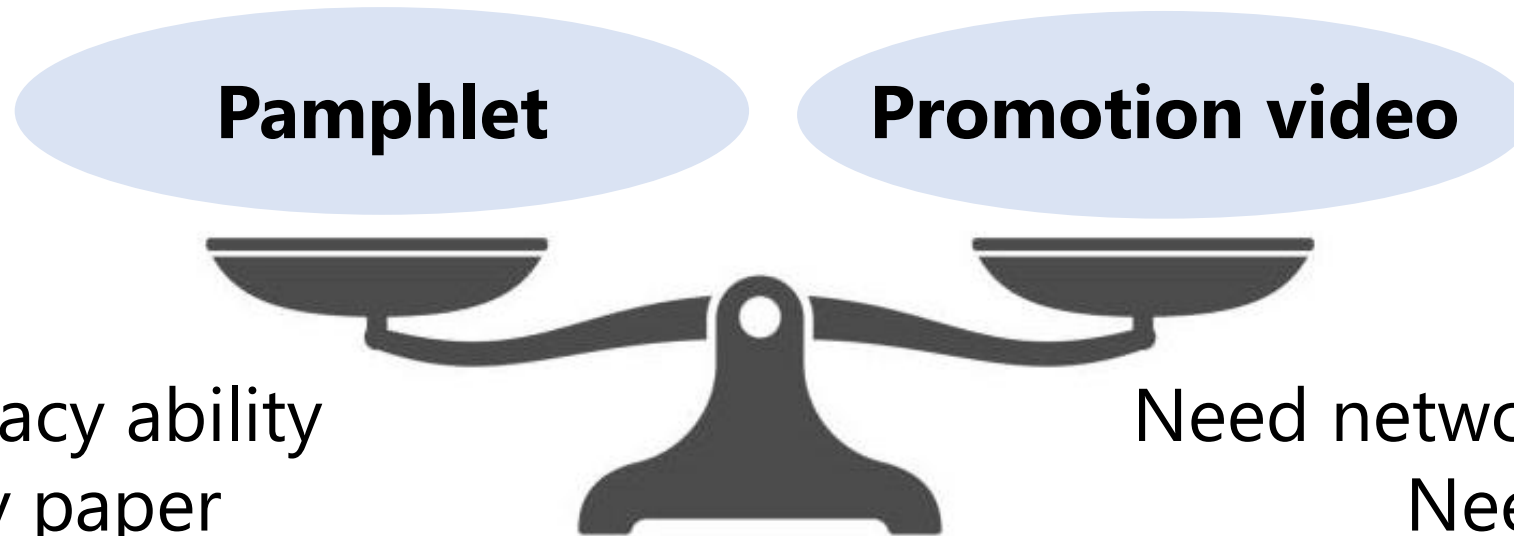
(3) Can the swallowable gum increase the amount of saliva to the ideal amount?

Compare the amount of saliva before with after chewing  
※唾液



## 2. Methodology

(4) How to spread the information of the gum to developing countries.



Need literacy ability  
Need only paper  
Doesn't need network system

Need network system  
Need devices  
Doesn't need literacy ability



## 2. Methodology

(4) How to spread the information of the gum to developing countries.

**Pamphlet**

**Promotion video**

Need literacy ability  
Need only paper  
Doesn't need network system

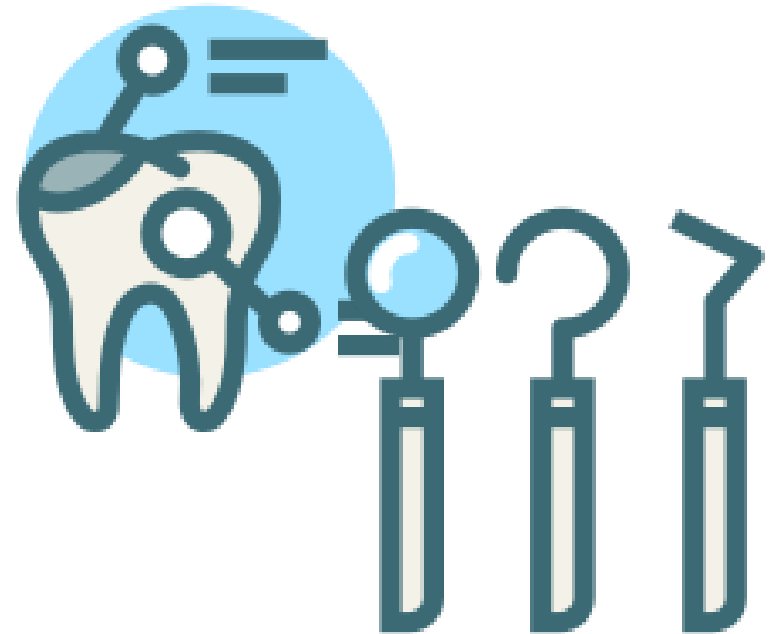
Need network system  
Need devices  
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1. Background & Objective

2. Methodology

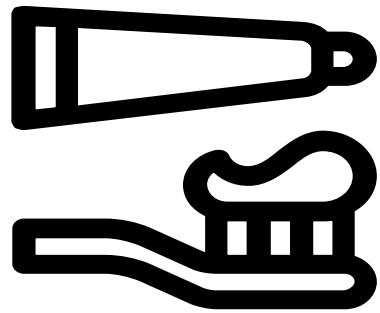
**3. Results** & Discussion

4. Conclusion



# 3. Results & Discussion

(1) Does making gum need less water than brushing teeth?



Once

=



6L



× 1 piece

=



0.13L

# 3. Results & Discussion

(1) Does making gum need less water than brushing teeth?

**Adding salt**



The flour easily gathered well.

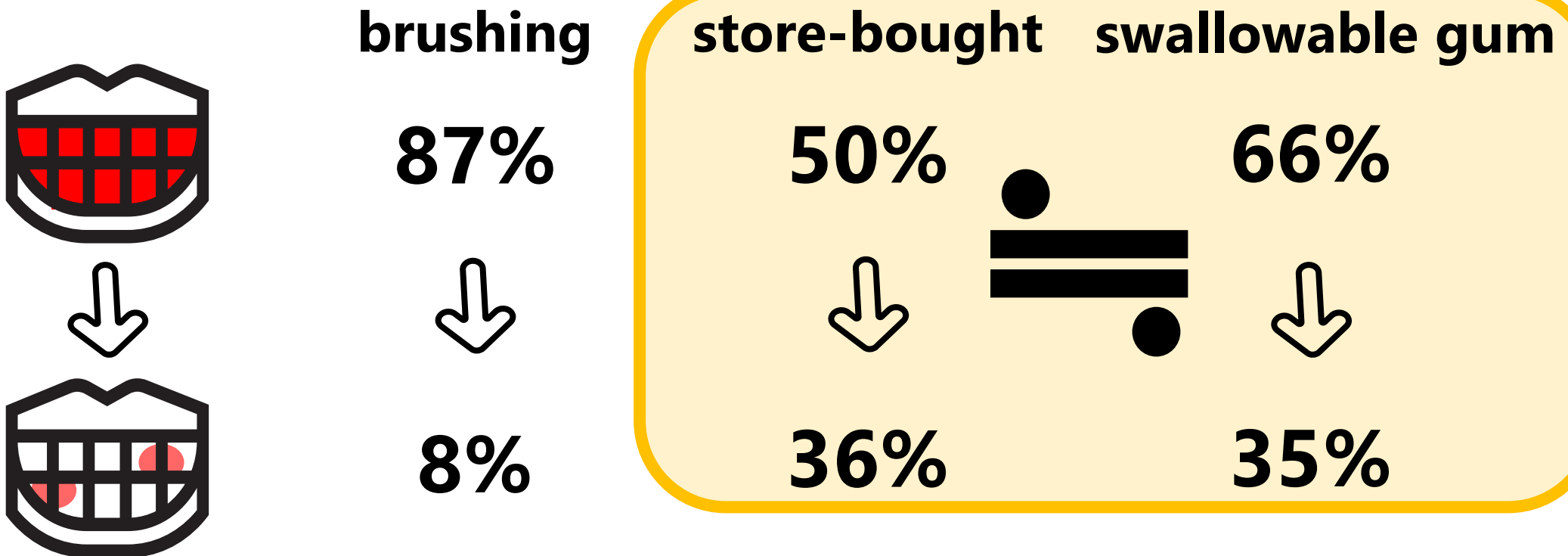


The amount of **water** used to wash the gum **decreased**



# 3. Results & Discussion

(2) Can the swallowable gum remove as much plaque as store-bought gum?



# 3. Results & Discussion

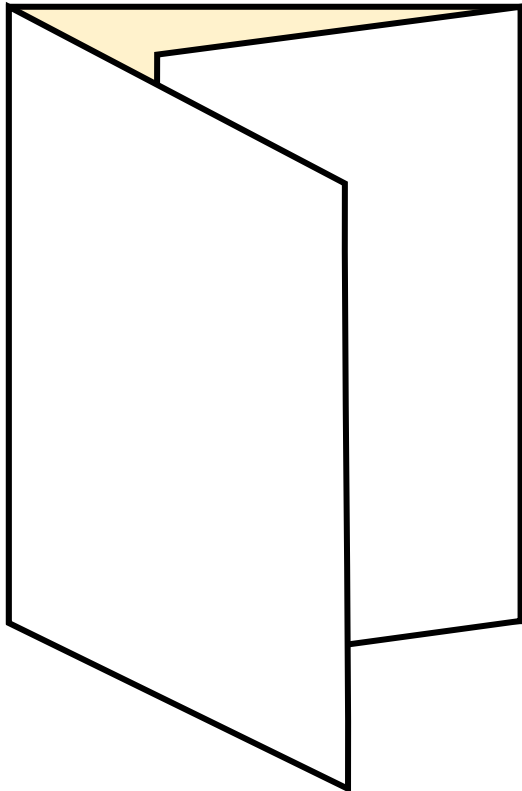
(3) Can the swallowable gum increase the amount of saliva to the ideal amount?

The amount of saliva (g)	Subject 1	Subject 2	Subject 3	Average
Normal	1	1	1	1
0L	1.5	6.5	1.5	3.16
0L (the gap from normal)	0.5	5.5	0.5	2.16
1L	4.0	3.5	2.5	3.33
1L (the gap from normal)	3.0	2.5	1.5	2.33
2L	3.0	2.5	1.5	2.33
2L (the gap from normal)	2.0	1.5	0.5	1.33
3L	3.5	2.5	1.5	2.5
3L (the gap from normal)	2.5	1.5	0.5	1.5

Increase to **2.7g**  
(the ideal is **2.0g**)

# 3. Results & Discussion

(4) How to spread the information of the gum to developing countries.



**Three-fold type**

※ 三つ折りタイプ

**All in English**

## What is the swallowable gum?

### Salivation

Our mouth's enemy is drying. Saliva can protect our mouth from drying. And it has many functions for keeping oral hygiene clean! Chewing gum is good for salivation.

### Removing plaque

Plaque is cause of tooth decay.  
Gum can stick plaque on itself and remove plaque.

### Strengthening jaw

Chewing many times strengthens our jaw. Strong jaw is important for our health. Gum promotes chewing a lot.

### Safe to swallow

To swallow ordinary gum is very dangerous because it is not digested. The swallowable gum is made from bread flour, so it's safe to swallow.



Japan

**Nagasaki Higashi High School**

# The front page

## [Title]

Introduction of  
The Swallowable Gum



Gum for Oral Care



## What is the swallowable gum?

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# The back page

[school name]



Japan  
Nagasaki Higashi High School

# The front page

[Title]

Introduction of  
The Swallowable Gum



Gum for Oral Care

What is the swallowable gum?

# The wrap-around page

[Explanation of swallowable gum]

※ wrap-around page  
巻き込み面

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# The back page

[school name]



Japan

Nagasaki Higashi High School

## Introduction of The Swallowable Gum



Gum for Oral Care

Why is it important to keep oral hygiene clean ?

# 1 Big impact on the whole body

Oral hygiene has a big impact on the whole body. Having good oral hygiene is important for the overall health of the whole body. Bad oral hygiene has bad impact on the body like significant diseases, and good oral hygiene has good impact on body.

# The importance of oral care

# 2 Strengthening our body

Oral care not only cleans our mouth but also can make our body stronger. Many people in the world die of infections. Oral care can lead immunity powerful, so by doing oral care regularly, you can fight against infections.

Let's make swallowable gum!

Making gum is so easy that anyone can make.

ingredients (for 15 pieces)

bread flour 50g    water 20cc (+2.0L)    salt 4g

- ✧ This gum can be eaten for a week.
- It doesn't mean that you don't have to do any other oral care like brushing.

Chew the gum  
Clean oral hygiene  
and you can get strong body

Step 1



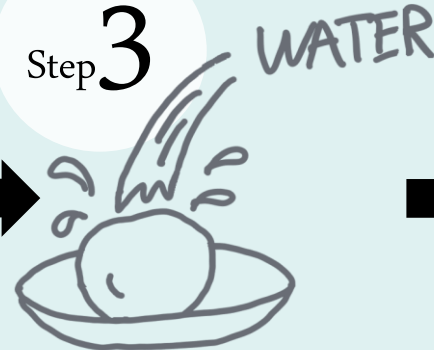
Mix all the ingredients.

Step 2



Rest the dough for an hour.

Step 3



Wash it until water becomes transparent.

Step 4



Cut and divide the gum into 15 pieces. (15g/1piece)

COMPLETE

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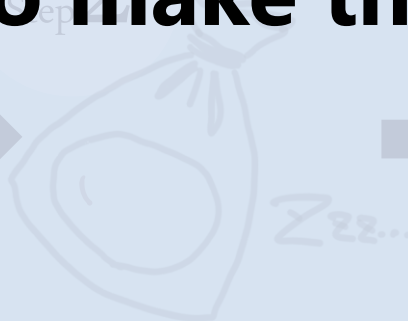
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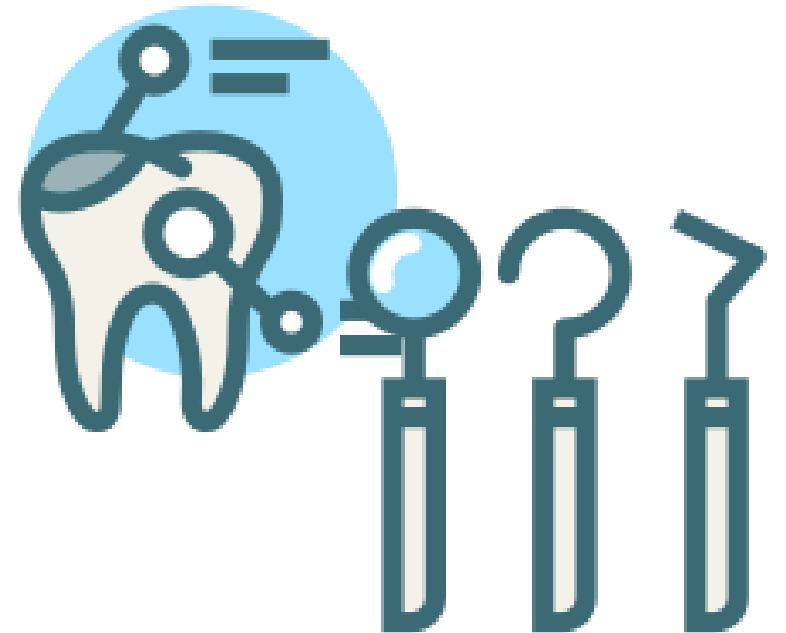
COMPLETE

1. Background & Objective



2. Methodology

3. Results & **Discussion**



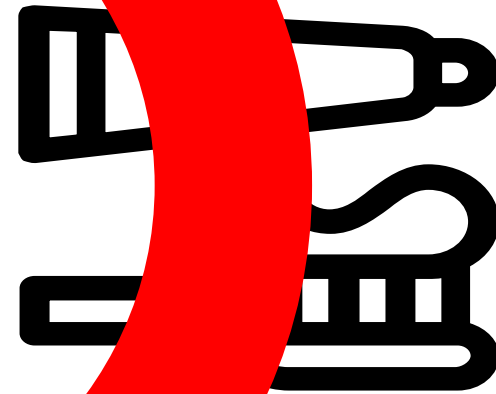
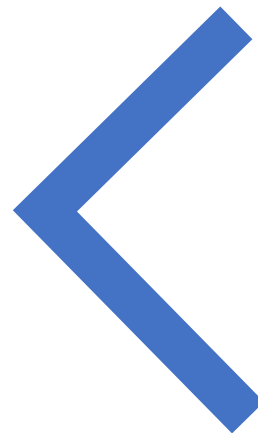
4. Conclusion

# 3. Results & Discussion

1. Does making gum \_\_\_\_\_ than brushing teeth?



The gum :



...ning : 6.0L

# 3. Results & Discussion

(2) Can the swallowable gum remove as much plaque as pre-bought gum?

The gum works as well as pre-bought gum.

(3) Can the swallowable gum increase the amount of saliva to the ideal amount?

The gum can increase the amount of saliva.



**Swallowable gum can be one way to maintain good oral hygiene.**

# 3. Results & Discussion

(4) How to spread the information of the gum to develop...s.

Why is it important to keep oral hygiene clean ?

**1 Big impact on the whole body**  
Oral hygiene has a big impact on our whole body. Having good oral hygiene is important for the overall health of the whole body. Bad oral hygiene has bad impact on the body like significant diseases, and good oral hygiene has good impact on body.

**2 Strengthening our body**  
Oral care not only clean our mouth but also can make our body stronger. Many people in the world die of infections. Oral care can lead immunity powerful, so by doing oral care regularly, you can fight against infections.

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Chew the gum  
Clean oral hygiene  
and you can get strong body

**Step 1** Mix all the ingredients.

**Step 2** Rest the dough for an hour.

**Step 3** Wash it until water becomes transparent.

**Step 4** Cut and divide the gum into 15 pieces. (15g/1piece)

**COMPLETE**

part

**NO** opinion and **NO** advice

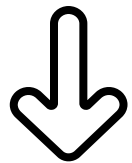
Haven't sent it to the target area



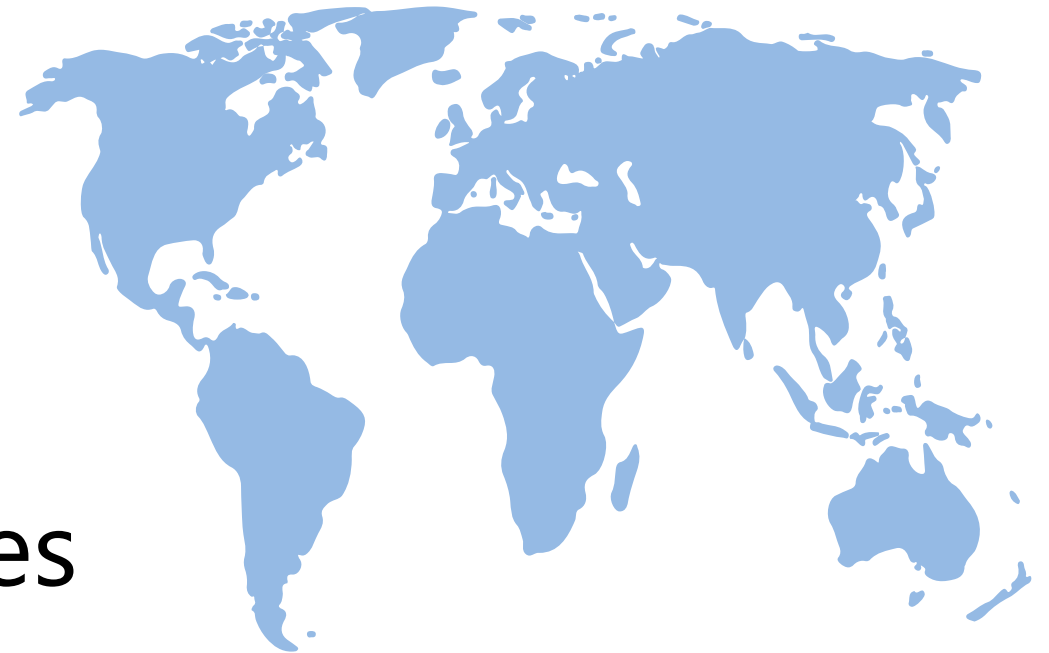
# 3. Results & Discussion

(4) How to spread the information of the gum to developing countries.

All in English



Adapt to many countries



# 3. Results & Discussion

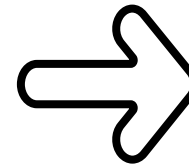
(4) How to spread the information of the gum to developing countries.



paper



online



**easier to  
spread**

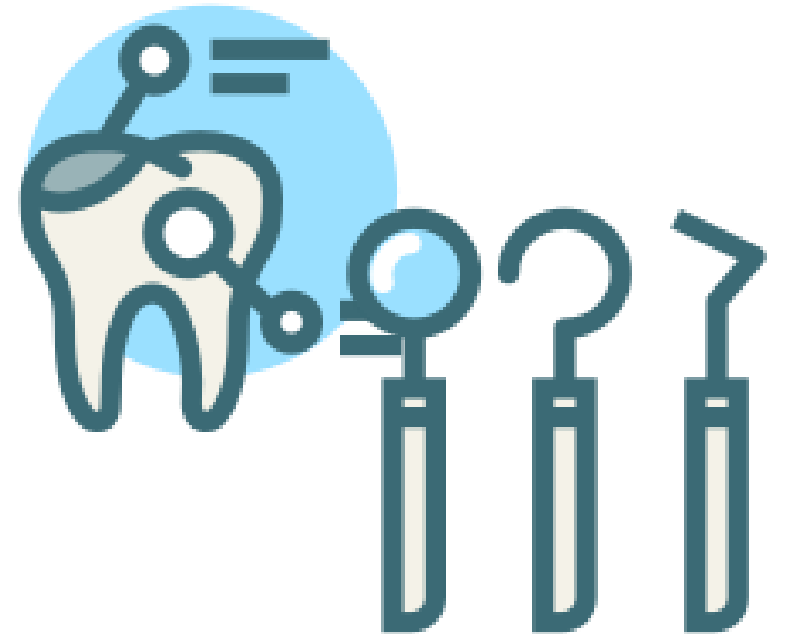
1. Background & Objective



2. Methodology

3. Results & Discussion

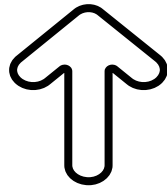
**4. Conclusion**



# 4. Conclusion

## OBJECTIVE

**To improve oral hygiene in developing countries**



**The swallowable gum**  
oral care with less water

**HOWEVER**



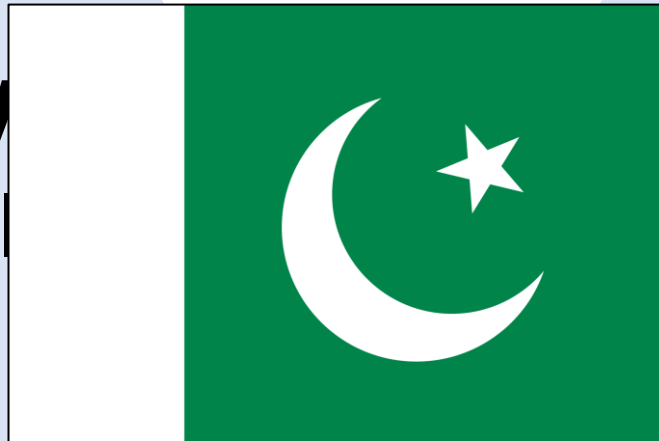
**× spread**

# 4. Conclusion

## Remaining tasks

### Pakistan

**Improve**  
the pamphlet



- Send**
- Unstable medical care
  - high literacy rate
  - the target area
  - English

**Thank You for listening!**



# References

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