In [283]:

```
#safehaven
# Import packages
import pandas as pd
import numpy as np
import plotly.express as px
import matplotlib.pyplot as plt
import seaborn as sns
from statsmodels.graphics.mosaicplot import mosaic
```

In [284]:

```
df = pd.read_csv("safehaven.csv")
df.tail(13)
```

Out[284]:

	Timestamp	What is your age?	What is your gender?	What is your current marital status?	Do you have access to a smartphone?	Have you ever experienced abuse in your life?	If yes, what types of al have you perso experienced or witnes (Check all that a
14	2024/03/09 10:47:06 AM GMT+3	32	Female	Married	Yes	No	
15	2024/03/09 12:49:01 PM GMT+3	36	Female	Married	Yes	Yes	Phy abuse;Emotional/psycholo abus
16	2024/03/09 1:49:11 PM GMT+3	33	Male	Married	Yes	No	
17	2024/03/09 4:37:40 PM GMT+3	26	Female	Single	Yes	No	
18	2024/03/09 7:03:07 PM GMT+3	33	Female	Married	Yes	No	
19	2024/03/09 8:55:02 PM GMT+3	36	Female	Single	Yes	Yes	Phy abuse;Emotional/psycholo abus
20	2024/03/12 7:26:04 AM GMT+3	26 years	Female	Single	Yes	No	Witnessing viol
21	2024/03/12 9:31:47 AM GMT+3	29	Female	Single	Yes	Yes	Emotional/psychological a
22	2024/03/12 4:51:27 PM GMT+3	25	Male	Single	Yes	No	
23	2024/03/15 5:51:40 PM GMT+3	37	Female	Married	Yes	Yes	Emotional/psychological a
24	2024/03/15 6:36:31 PM GMT+3	30	Female	Married	Yes	Yes	Discriminatory a

	Timestamp	What is your age?	What is your gender?	What is your current marital status?	Do you have access to a smartphone?	Have you ever experienced abuse in your life?	If yes, what types of al have you perso experienced or witnes (Check all that a
25	2024/03/15 7:54:25 PM GMT+3	34	Female	Married	Yes	No	Emotional/psychological a
26	2024/03/16 1:09:41 AM GMT+3	21	Female	Single	Yes	No	Discrimin abuse;Witnessing viol

13 rows × 27 columns

In [285]:

```
#Extract columns
cols = df.columns
#Create empty list
new_cols = []
#iterate to fix issues with names
for column in cols:
    #to proper case
    proper_cols = column.title()
    #replace space/hyphen with underscore
    proper_cols_hyphen = proper_cols.replace(" ", "_")
    clean_col = proper_cols_hyphen.replace("-", "_")
    #append to empty list
    new_cols.append(clean_col)
#diplay columns
new_cols

#replace existing columns in dataframe with new
df.columns = new_cols

#preview
df.head()
```

Out[285]:

	Timestamp	What_Is_Your_Age?	What_Is_Your_Gender?	What_Is_Your_Current_Marital_Sta
0	2024/03/06 2:02:41 PM GMT+3	NaN	Female	S
1	2024/03/07 2:31:22 PM GMT+3	30	Female	Ma
2	2024/03/07 8:06:15 PM GMT+3	23	Female	S
3	2024/03/07 8:39:16 PM GMT+3	31	Female	Ma
4	2024/03/07 10:02:26 PM GMT+3	36	Female	S

5 rows × 27 columns

In [ ]:

In [286]:

```
df = df.rename(columns={
    'Timestamp': 'Timestamp',
    'What_Is_Your_Age?': 'Age',
    'What_Is_Your_Gender?': 'Gender',
    'What_Is_Your_Current_Marital_Status?': 'Marital_Status',
    'Do_You_Have_Access_To_A_Smartphone?': 'Smartphone_Access',
    'Have_You_Ever_Experienced_Abuse_In_Your_Life?_': 'Experienced_Abuse',
    'If_Yes,_What_Types_Of_Abuse_Have_You_Personally_Experienced_Or_Witnes
    'What_Relationship_Do_You_Have_With_Your_Abuser?': 'Abuser_Relationshi
    'Have_You_Sought_Support_Or_Help_Related_To_Abuse?': 'Sought_Abuse_Sup
    'If_Yes,_Please_Specify_The_Type_Of_Support_You_Sought_(E.G.,_Counseli
    'What_Are_The_Biggest_Challenges_You_Face_When_It_Comes_To_Seeking_Hel
    'What_Strategies_Or_Coping_Mechanisms_Have_Empowered_You_During_Diffic
    'How_Can_Society_Better_Support_Survivors_Of_Abuse?': 'Society_Support
    'Do_You_Believe_That_Technology,_Such_As_Web_Applications,_Can_Be_Help
    'Have_You_Ever_Used_A_Web_Application_To_Seek_Help_Or_Support_For_Pers
    'What_Features_Or_Functionalities_Would_You_Expect_To_See_In_A_Web_App
    'How_Concerned_Are_You_About_The_Safety_And_Privacy_Of_Using_A_Web_App
    'What_Measures_Would_You_Like_To_See_Implemented_In_A_Web_Application_
    'What_Types_Of_Support_Services_Would_You_Find_Most_Helpful_In_A_Web_A
    'How_Important_Is_It_For_A_Web_Application_To_Provide_Access_To_Resour
    'Would_You_Like_The_Option_To_Connect_With_Other_Individuals_Who_Have_
    'How_Likely_Are_You_To_Use_A_Web_Application_That_Provides_Real_Time_S
    'What_Additional_Features_Or_Functionalities_Would_You_Like_To_See_In_
    'Do_You_Have_Any_Other_Comments_Or_Suggestions_For_Improving_A_Web_App
})
df.head()
```

Out[286]:

	Timestamp	Age	Gender	Marital_Status	Smartphone_Access	Experienced_Abuse	Types
0	2024/03/06 2:02:41 PM GMT+3	NaN	Female	Single	Yes	No	
1	2024/03/07 2:31:22 PM GMT+3	30	Female	Married	Yes	Yes	
2	2024/03/07 8:06:15 PM GMT+3	23	Female	Single	Yes	Yes	
3	2024/03/07 8:39:16 PM GMT+3	31	Female	Married	Yes	Yes	
4	2024/03/07 10:02:26 PM GMT+3	36	Female	Single	Yes	Yes	

5 rows × 27 columns

In [287]:

```
# Remove white spaces from all columns
df = df.applymap(lambda x: x.strip() if isinstance(x, str) else x)
```

In [288]:

```
# Replace NaN values in 'Types_of_Abuse_Felt_Seen' column with 'None'
df['Types_of_Abuse_Felt_Seen'] = df['Types_of_Abuse_Felt_Seen'].fillna('No

df['Type_of_Support_Sought'] = df['Type_of_Support_Sought'].replace(['Coun

df['Type_of_Support_Sought'] = df['Type_of_Support_Sought'].replace(['Coun


df['Age'] = df['Age'].replace(['26 years'], 26)

# Define the list of values to be replaced
values_to_replace = ['No', 'Non', 'Not applicable', 'Nil', 'NIL', np.nan,

# Replace the values in the Type_of_Support_Sought column with 'None'
df['Type_of_Support_Sought'] = df['Type_of_Support_Sought'].replace(values

# Define the list of values to be replaced
values = ['No one', 'Non', 'Not applicable', np.nan]

# Replace the values in the Abuser_Relationshi' column with 'None'
df['Abuser_Relationship'] = df['Abuser_Relationship'].replace(values, 'Non

# Replace other specified values like 'Non' and 'Bn' with 'None'
df['Types_of_Abuse_Felt_Seen'] = np.where(df['Types_of_Abuse_Felt_Seen'] =
df['Types_of_Abuse_Felt_Seen'] = np.where(df['Types_of_Abuse_Felt_Seen'] =


# Create a mask to filter rows with the specified string in 'Abuser_Relati
mask = df['Abuser_Relationship'].str.contains("As a child, my neighbour, a

# Replace the values using loc
df.loc[mask, 'Abuser_Relationship'] = 'Neighbor, Guardian, Husband'
```

In [289]:

```
columns_to_drop = ['Timestamp', 'Unnamed:_24', 'Unnamed:_25', 'Unnamed:_26
df = df.drop(columns_to_drop, axis=1)
```

In [290]:
```
#Dropping the missing or null values
print(df.isnull().sum())
```

```
Age                                          1
Gender                                       0
Marital_Status                               0
Smartphone_Access                            0
Experienced_Abuse                            0
Types_of_Abuse_Felt_Seen                     0
Abuser_Relationship                          0
Sought_Abuse_Support                         0
Type_of_Support_Sought                       0
Challenges_Facing_Help                       6
Empowerment_Strategies                       3
Society_Support_for_Survivors                2
Belief_in_Tech_for_Abuse                     0
Used_WebApp_for_Support                      1
Expected_WebApp_Features                     0
Safety_Privacy_Concerns_WebApp               0
Safety_Privacy_Measures_WebApp               1
Helpful_Support_Services_WebApp              0
Importance_of_Access_to_Resources_WebApp     0
Option_to_Connect_with_Others_WebApp         0
Likelihood_of_Using_RealTimeSupport_WebApp   0
Additional_Features_Desired_WebApp           5
Other_Comments_for_Improvement_WebApp        5
dtype: int64
```

In [291]:
```
df_filled = df.fillna(method='bfill')
print(df_filled.isnull().sum())
```

```
Age                                          0
Gender                                       0
Marital_Status                               0
Smartphone_Access                            0
Experienced_Abuse                            0
Types_of_Abuse_Felt_Seen                     0
Abuser_Relationship                          0
Sought_Abuse_Support                         0
Type_of_Support_Sought                       0
Challenges_Facing_Help                       0
Empowerment_Strategies                       0
Society_Support_for_Survivors                0
Belief_in_Tech_for_Abuse                     0
Used_WebApp_for_Support                      0
Expected_WebApp_Features                     0
Safety_Privacy_Concerns_WebApp               0
Safety_Privacy_Measures_WebApp               0
Helpful_Support_Services_WebApp              0
Importance_of_Access_to_Resources_WebApp     0
Option_to_Connect_with_Others_WebApp         0
Likelihood_of_Using_RealTimeSupport_WebApp   0
Additional_Features_Desired_WebApp           0
Other_Comments_for_Improvement_WebApp        0
dtype: int64
```

In [292]:

```
df = df_filled.fillna(method='ffill')
print(df.isnull().sum())
```

```
Age                                          0
Gender                                       0
Marital_Status                               0
Smartphone_Access                            0
Experienced_Abuse                            0
Types_of_Abuse_Felt_Seen                     0
Abuser_Relationship                          0
Sought_Abuse_Support                         0
Type_of_Support_Sought                       0
Challenges_Facing_Help                       0
Empowerment_Strategies                       0
Society_Support_for_Survivors                0
Belief_in_Tech_for_Abuse                     0
Used_WebApp_for_Support                      0
Expected_WebApp_Features                     0
Safety_Privacy_Concerns_WebApp               0
Safety_Privacy_Measures_WebApp               0
Helpful_Support_Services_WebApp              0
Importance_of_Access_to_Resources_WebApp     0
Option_to_Connect_with_Others_WebApp         0
Likelihood_of_Using_RealTimeSupport_WebApp   0
Additional_Features_Desired_WebApp           0
Other_Comments_for_Improvement_WebApp        0
dtype: int64
```

In [293]:

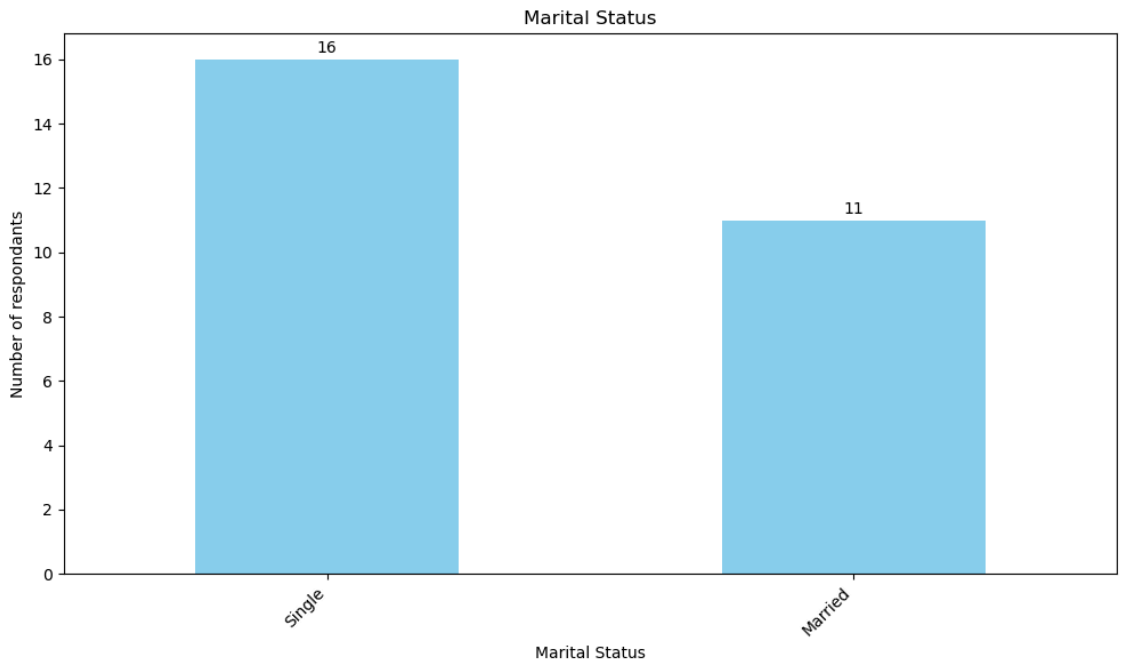
```
df['Age'] = df['Age'].astype(int)
```

In [294]:
```
df.dtypes
```

Out[294]:
```
Age                                          int32
Gender                                      object
Marital_Status                              object
Smartphone_Access                           object
Experienced_Abuse                           object
Types_of_Abuse_Felt_Seen                    object
Abuser_Relationship                         object
Sought_Abuse_Support                        object
Type_of_Support_Sought                      object
Challenges_Facing_Help                      object
Empowerment_Strategies                      object
Society_Support_for_Survivors               object
Belief_in_Tech_for_Abuse                    object
Used_WebApp_for_Support                     object
Expected_WebApp_Features                    object
Safety_Privacy_Concerns_WebApp              object
Safety_Privacy_Measures_WebApp              object
Helpful_Support_Services_WebApp             object
Importance_of_Access_to_Resources_WebApp    object
Option_to_Connect_with_Others_WebApp        object
Likelihood_of_Using_RealTimeSupport_WebApp  object
Additional_Features_Desired_WebApp          object
Other_Comments_for_Improvement_WebApp       object
dtype: object
```

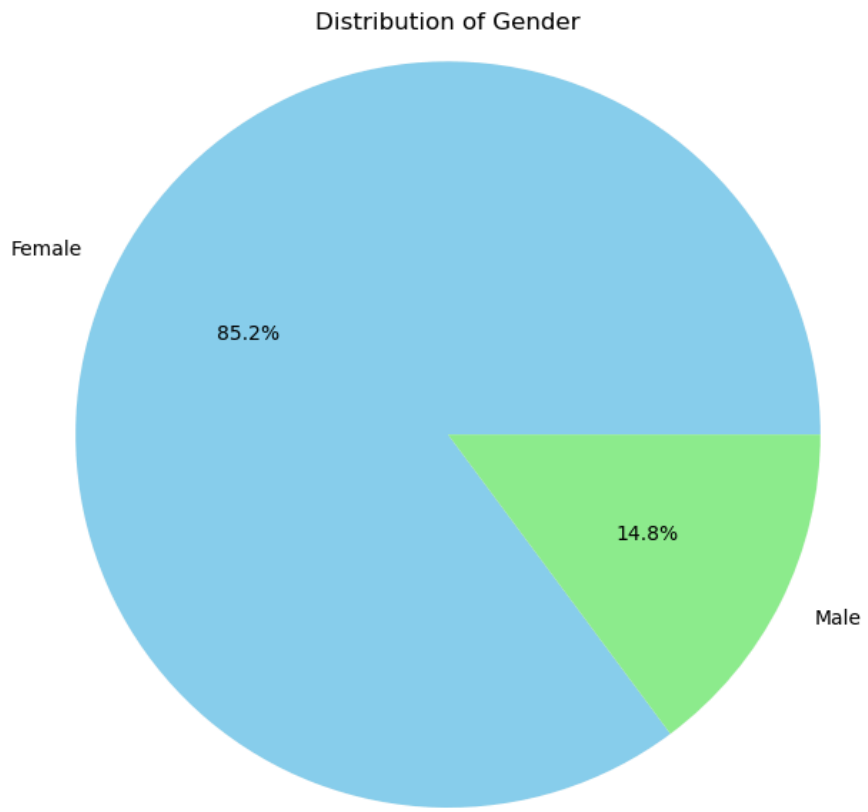
In [295]:

```
# Count the occurrences of each marital status
marital_status_counts = df['Marital_Status'].value_counts()

# Plot the counts of marital status
plt.figure(figsize=(10, 6))
marital_status_counts.plot(kind='bar', color='skyblue')
plt.title('Marital Status')
plt.xlabel('Marital Status')
plt.ylabel('Number of respondants')
plt.xticks(rotation=45, ha='right')  # Rotate x-axis labels for better rea
plt.tight_layout()

# Adding annotation for each bar
for i, count in enumerate(marital_status_counts):
    plt.text(i, count + 0.1, str(count), ha='center', va='bottom')

plt.show()
```



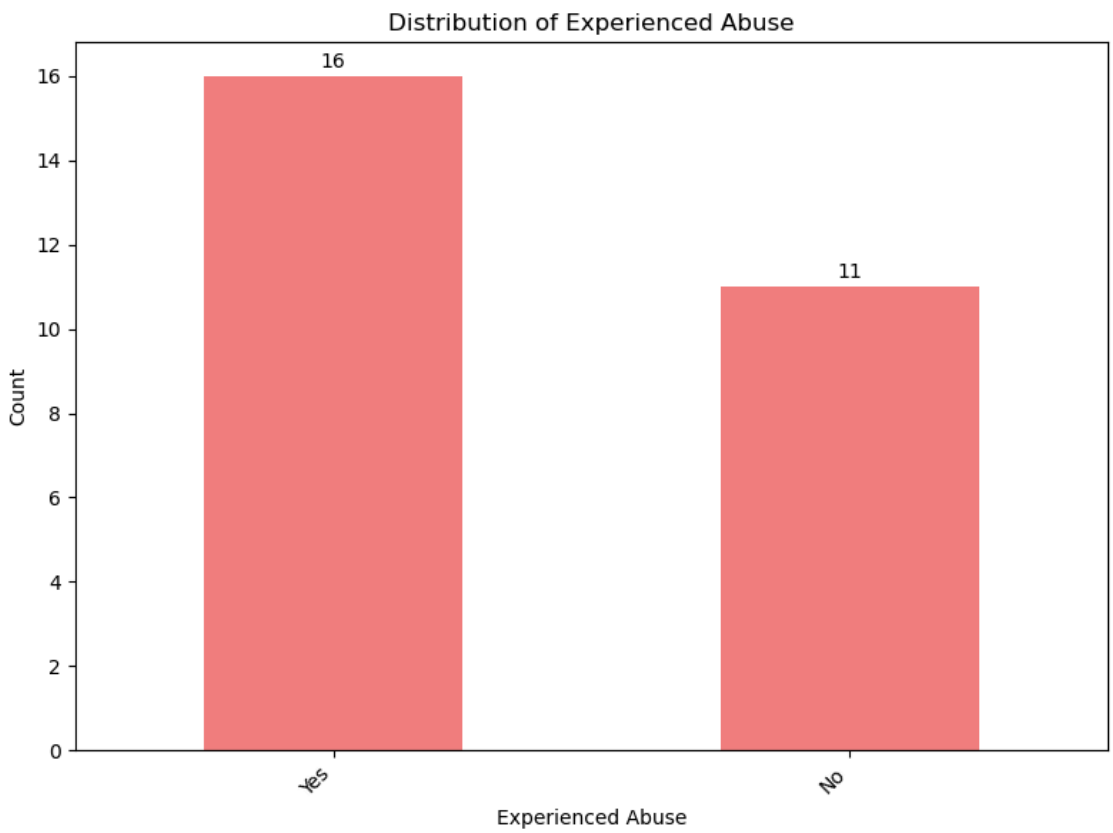
In [296]:

```
# Count the occurrences of each gender
gender_counts = df['Gender'].value_counts()

# Plot the counts of gender as a pie chart
plt.figure(figsize=(8, 6))
plt.pie(gender_counts, labels=gender_counts.index, autopct='%1.1f%%', colo
plt.title('Distribution of Gender')
plt.axis('equal')  # Equal aspect ratio ensures that pie is drawn as a cir
plt.tight_layout()

plt.show()
```



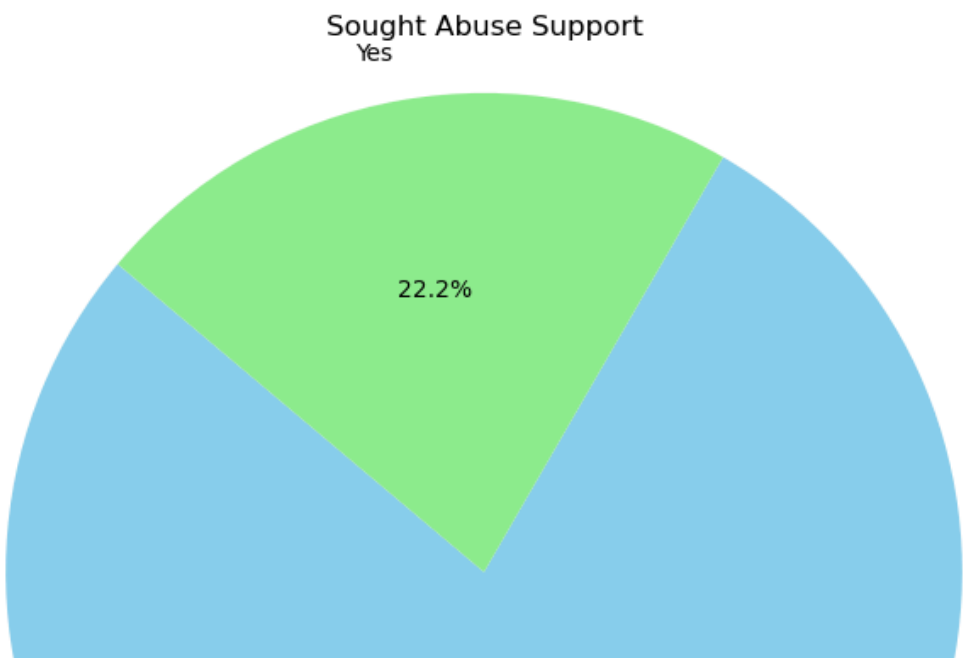
In [297]:

```
# Count the occurrences of each response in 'Experienced_Abuse'
abuse_counts = df['Experienced_Abuse'].value_counts()

# Plot the counts of experienced abuse
plt.figure(figsize=(8, 6))
abuse_counts.plot(kind='bar', color='lightcoral')
plt.title('Distribution of Experienced Abuse')
plt.xlabel('Experienced Abuse')
plt.ylabel('Count')
plt.xticks(rotation=45, ha='right')  # Rotate x-axis labels if needed
plt.tight_layout()

# Adding annotation for each bar
for i, count in enumerate(abuse_counts):
    plt.text(i, count + 0.1, str(count), ha='center', va='bottom')

plt.show()
```



In [298]:

```
# Count the occurrences of each response in the 'Sought_Abuse_Support' col
support_counts = df['Sought_Abuse_Support'].value_counts()

# Plot the pie chart
plt.figure(figsize=(8, 8))
plt.pie(support_counts, labels=support_counts.index, autopct='%1.1f%%', st
plt.title('Sought Abuse Support')
plt.axis('equal')  # Equal aspect ratio ensures that pie is drawn as a cir
plt.show()
```



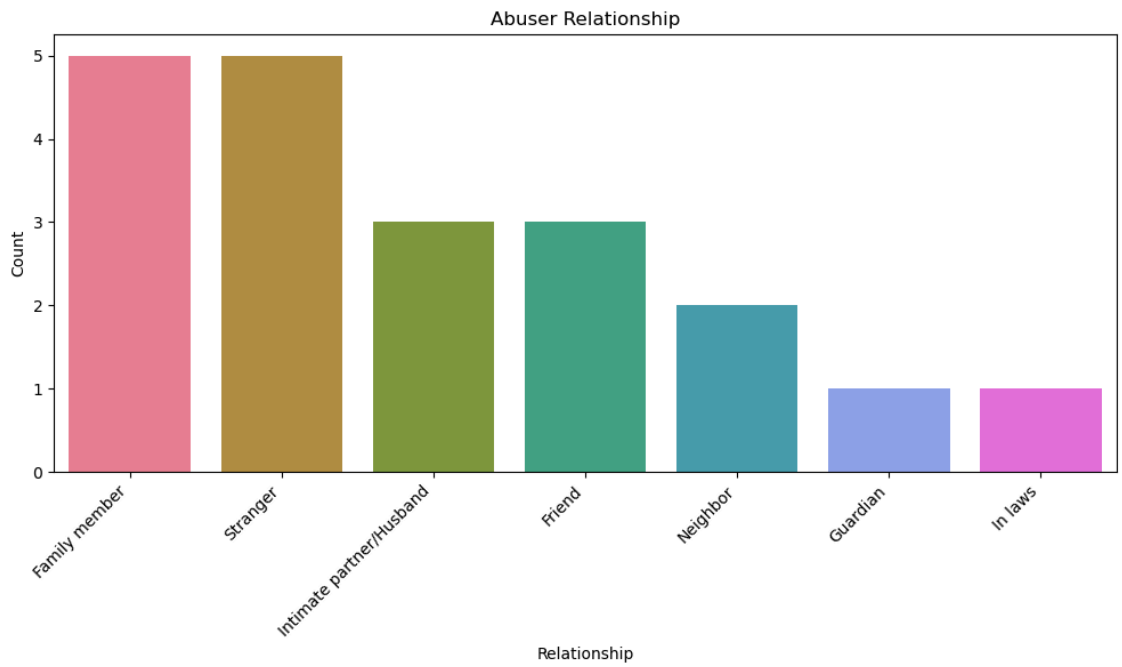
In [299]:

```
df['Abuser_Relationship'] = df['Abuser_Relationship'].astype(str)

# Split the responses into individual categories and create a new DataFram
split_df = df['Abuser_Relationship'].str.split(', ', expand=True)

# Stack the DataFrame to convert it into a Series
stacked = split_df.stack()

# Replace 'Intimate partner' and 'Husband' with 'Intimate partner/Husband'
stacked = stacked.replace({
    'Intimate partner': 'Intimate partner/Husband',
    'Husband': 'Intimate partner/Husband'
})

# Count the occurrences of each category
category_counts = stacked.value_counts()

# Print the counts
print(category_counts)
```

```
None                        9
Family member               5
Stranger                    5
Intimate partner/Husband    3
Friend                      3
Neighbor                    2
Guardian                    1
In laws                     1
Name: count, dtype: int64
```

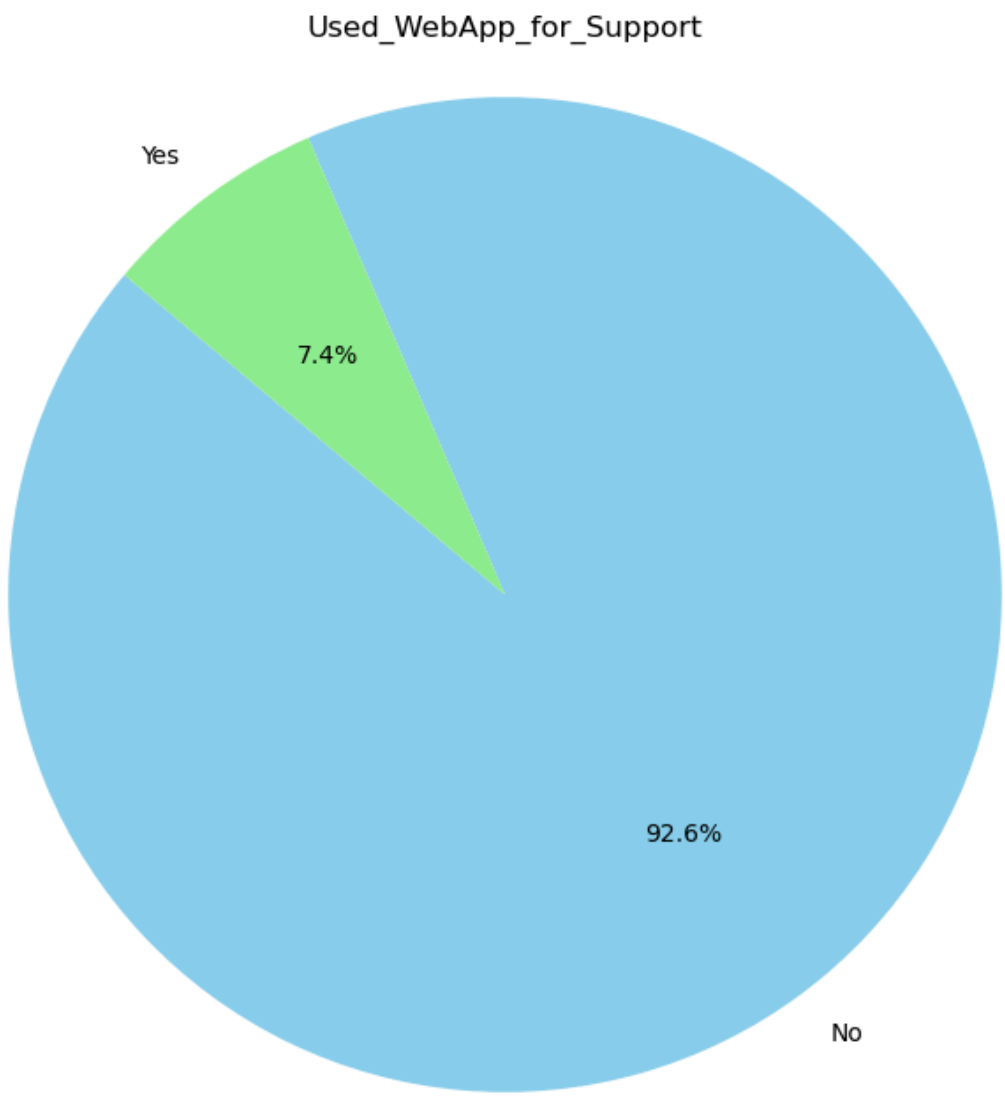
In [300]:

```
# Exclude 'None' from the category counts
category_counts = category_counts[category_counts.index != 'None']

# Plot a bar graph with each bar having a different color
plt.figure(figsize=(10, 6))
sns.barplot(x=category_counts.index, y=category_counts.values, palette='hu
plt.title('Abuser Relationship')
plt.xlabel('Relationship')
plt.ylabel('Count')
plt.xticks(rotation=45, ha='right')
plt.tight_layout()
plt.show()
```



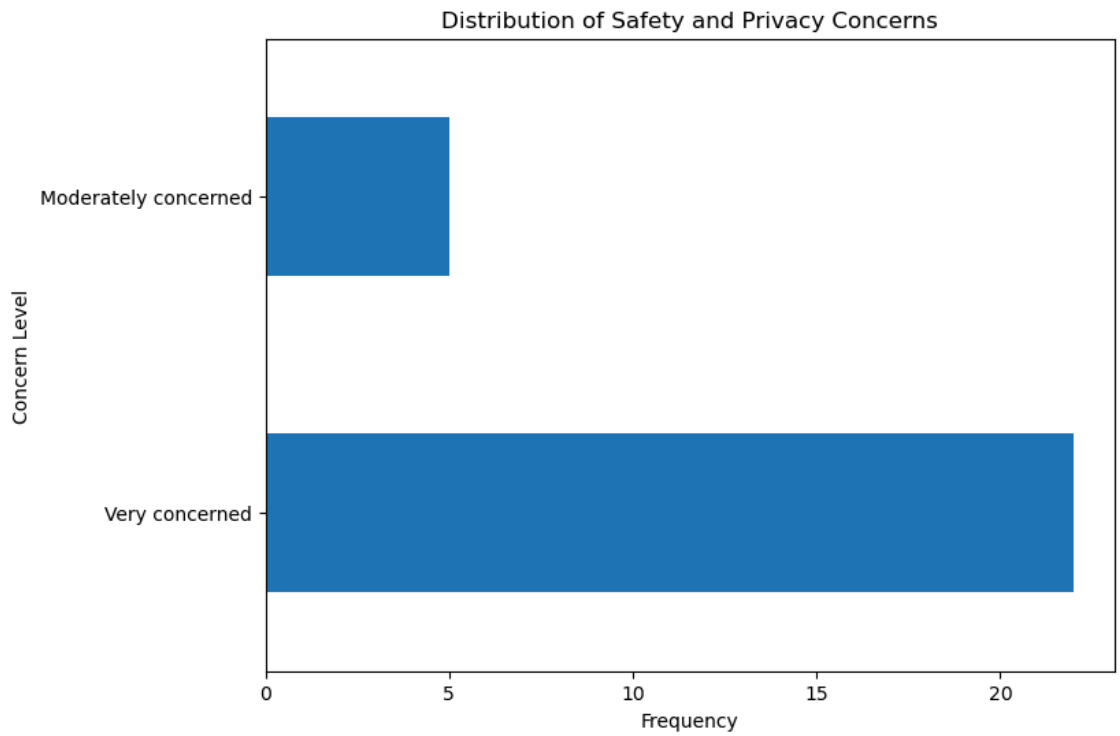
In [301]:

```
# Count the occurrences of each response in the 'Sought_Abuse_Support' col
support_counts = df['Used_WebApp_for_Support'].value_counts()

# Plot the pie chart
plt.figure(figsize=(8, 8))
plt.pie(support_counts, labels=support_counts.index, autopct='%1.1f%%', st
plt.title('Used_WebApp_for_Support')
plt.axis('equal')  # Equal aspect ratio ensures that pie is drawn as a cir
plt.show()
```



In [302]:

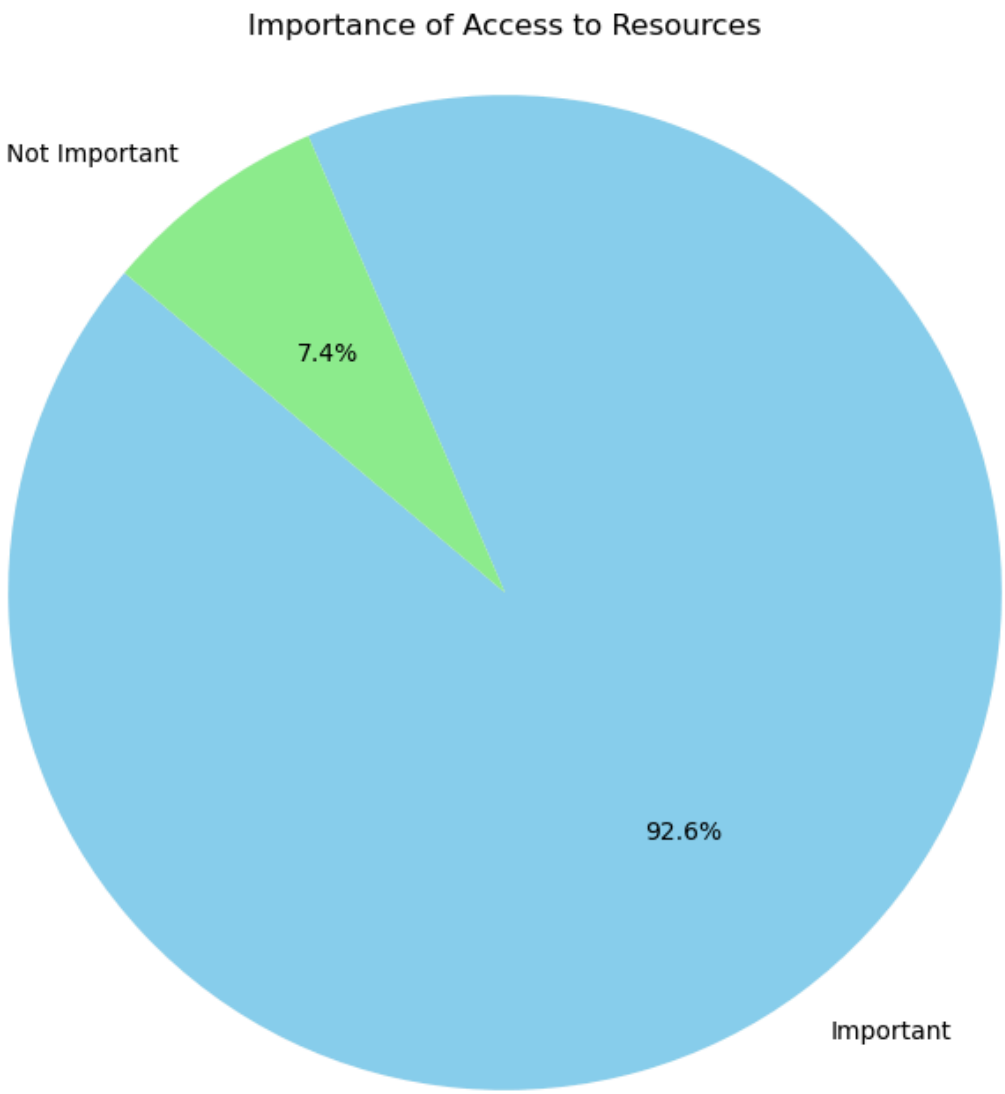
```
# Replace longer names with shorter ones
df['Safety_Privacy_Concerns_WebApp'] = df['Safety_Privacy_Concerns_WebApp'
    'Very concerned about the security of ones details': 'Very concerned',
    'Moderately concerned about the security of ones details': 'Moderately
})

# Plot the frequency distribution with shorter names in horizontal bars
plt.figure(figsize=(8, 6))
df['Safety_Privacy_Concerns_WebApp'].value_counts().plot(kind='barh')
plt.title('Distribution of Safety and Privacy Concerns')
plt.xlabel('Frequency')
plt.ylabel('Concern Level')
plt.show()
```



In [ ]:

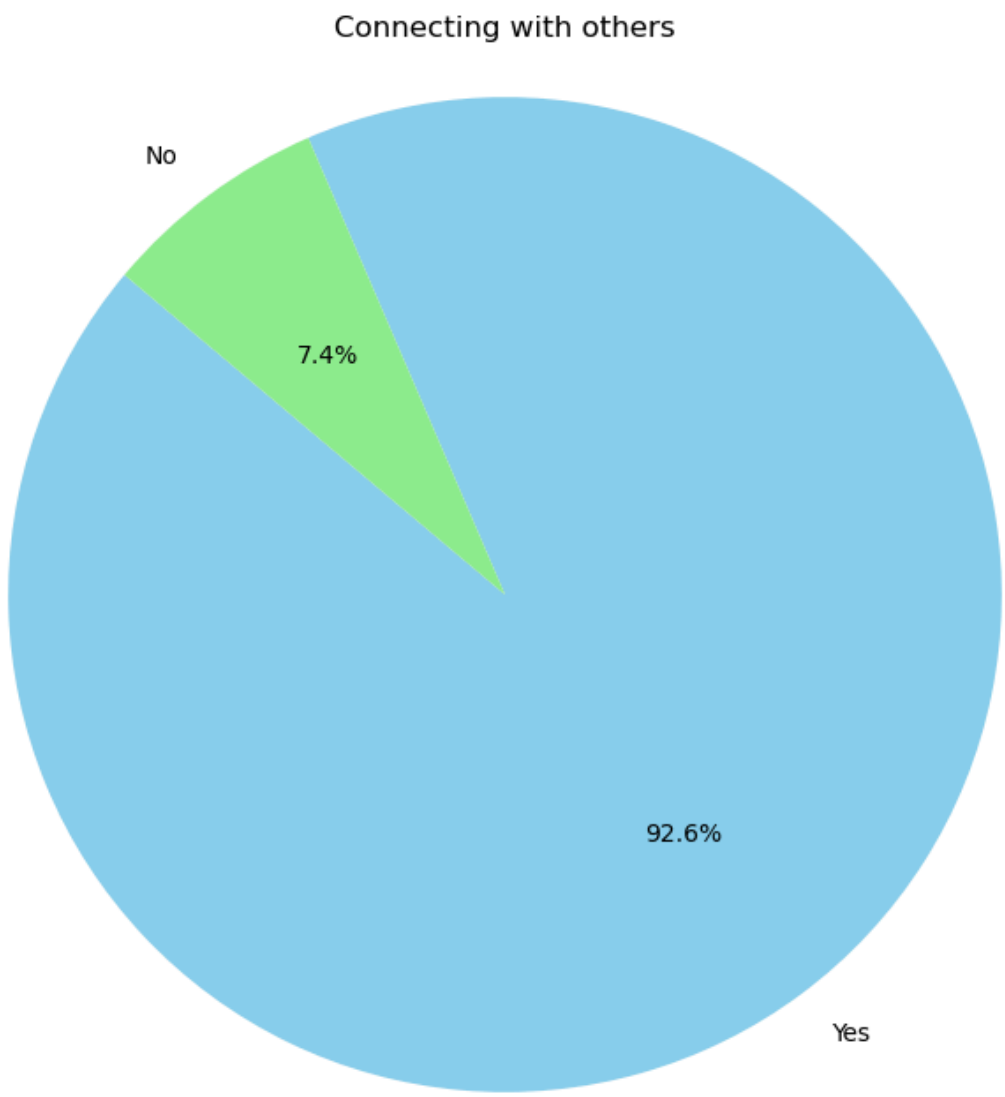
In [303]:

```
# Assuming df is your DataFrame containing the data
import matplotlib.pyplot as plt

# Get the frequency distribution of the column
expected_counts = df['Importance_of_Access_to_Resources_WebApp'].value_cou

# Plot the frequency distribution as a pie chart
plt.figure(figsize=(8, 8))
plt.pie(expected_counts, labels=expected_counts.index, autopct='%1.1f%%',
plt.title('Importance of Access to Resources')
plt.axis('equal')  # Equal aspect ratio ensures that pie is drawn as a cir
plt.show()
```



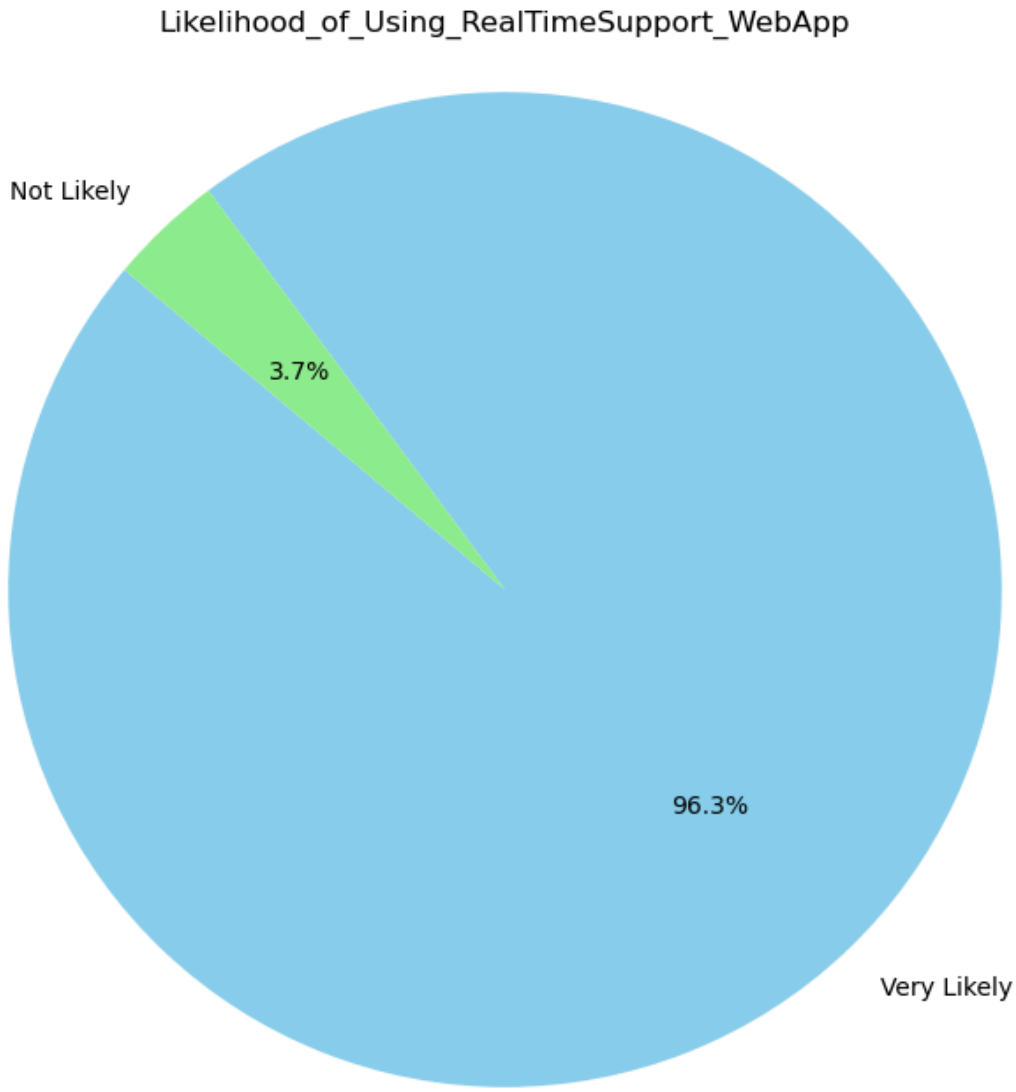
In [304]:

```
# Assuming df is your DataFrame containing the data
expected_counts = df['Option_to_Connect_with_Others_WebApp'].value_counts(

# Plot the frequency distribution as a pie chart
plt.figure(figsize=(8, 8))
plt.pie(expected_counts, labels=expected_counts.index, autopct='%1.1f%%',
plt.title('Connecting with others')
plt.axis('equal')  # Equal aspect ratio ensures that pie is drawn as a cir
plt.show()
```



In [305]:

```
# Assuming df is your DataFrame containing the data
expected_counts = df['Likelihood_of_Using_RealTimeSupport_WebApp'].value_c

# Plot the frequency distribution as a pie chart
plt.figure(figsize=(8, 8))
plt.pie(expected_counts, labels=expected_counts.index, autopct='%1.1f%%',
plt.title('Likelihood_of_Using_RealTimeSupport_WebApp')
plt.axis('equal')  # Equal aspect ratio ensures that pie is drawn as a cir
plt.show()
```

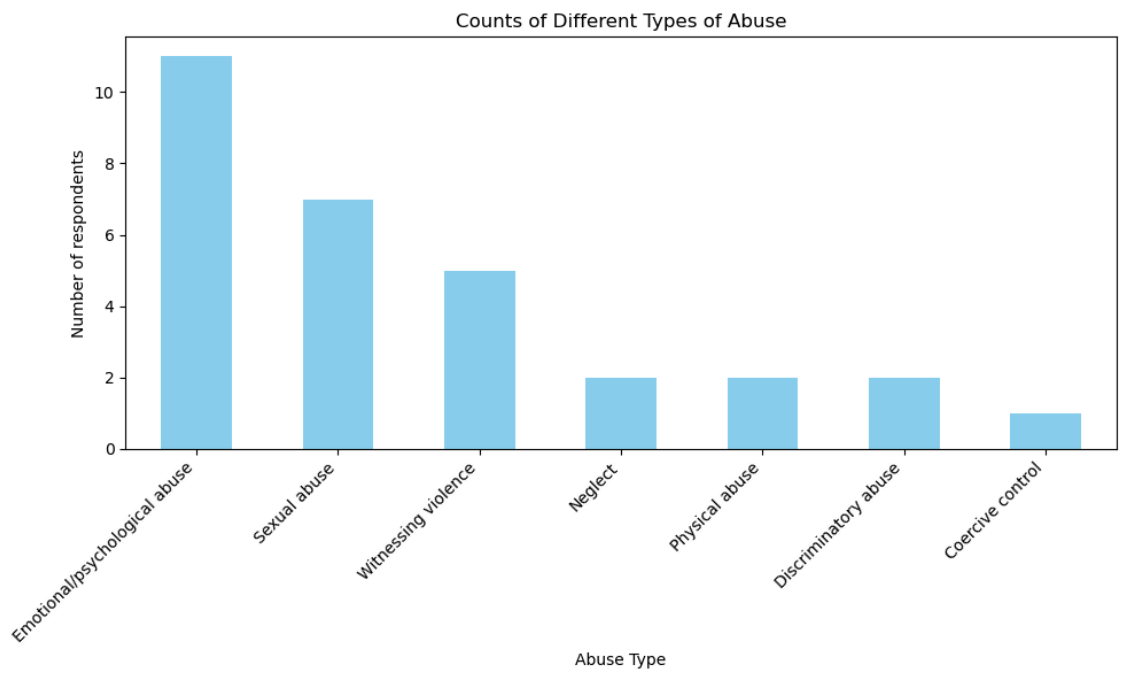


In [306]:

```
Abuse_Types = df['Types_of_Abuse_Felt_Seen'].str.split(';',expand=True)
```

In [307]:

```
import matplotlib.pyplot as plt


# Filter out 'None' values
Abuse_Types_filtered = Abuse_Types.apply(lambda row: row[row != 'None'], a

# Count occurrences of each abuse type
abuse_type_counts = Abuse_Types_filtered.stack().value_counts()


# Plot the counts without the "None" category
plt.figure(figsize=(10, 6))
abuse_type_counts.plot(kind='bar', color='skyblue')
plt.title('Counts of Different Types of Abuse')
plt.xlabel('Abuse Type')
plt.ylabel('Number of respondents')
plt.xticks(rotation=45, ha='right')  # Rotate x-axis labels for better rea

plt.tight_layout()
plt.show()
```



In [308]:
```
df['Helpful_Support_Services_WebApp'].value_counts()
```

Out[308]:
```
Helpful_Support_Services_WebApp
Counseling
2
Medical help, therapy
1
Suggesting social support locations, offering skills acquisition centres
as most victims are dependent on their abusers.        1
Causelling
1
Answer that emergency call and save lives
1
Counselling, empowerment, accomodation etc.
1
No idea
1
Online Counseling
1
Therapy
1
Free lines for calling
1
Therapy sessions
1
Educative
1
Quick response system, by sharing with the victims a location and whom to
meet, if possible mobility support incase of lack.    1
Anonymity
1
Counseling and friendship
1
Follow ups
1
NA
1
Family and sexual
1
Ability to speak or chat with a therapist
1
Counseling sessions and security personnel
1
Speed dail
1
Positive emotional coping
1
Counselling
1
Depending on the form of abuse
1
Calls emergency contacts
1
Effective ways to address abuse.
1
Name: count, dtype: int64
```

In [310]:

```
# Function to categorize the responses into topics
def categorize_topic(response):
    response = response.lower()
    if 'counseling' in response or 'therapy' in response:
        return 'Counseling Services'
    elif 'medical' in response or 'quick response' in response:
        return 'Medical Support'
    elif 'support' in response or 'skills acquisition' in response or 'fam
        return 'Social Support'
    elif 'emergency' in response or 'speed dial' in response:
        return 'Emergency Services'
    elif 'anonymity' in response or 'educative' in response or 'no idea' i
        return 'Anonymity and Education'
    else:
        return 'Other'

# Apply the function to create a new column indicating the topic for each
df2 = df['Helpful_Support_Services_WebApp'].apply(categorize_topic)

# Print the DataFrame with the topic column
print(df2)
```

```
0         Counseling Services
1         Counseling Services
2          Emergency Services
3                       Other
4                       Other
5     Anonymity and Education
6                       Other
7         Counseling Services
8         Counseling Services
9         Counseling Services
10                      Other
11             Social Support
12    Anonymity and Education
13                      Other
14    Anonymity and Education
15             Social Support
16            Medical Support
17    Anonymity and Education
18        Counseling Services
19                      Other
20        Counseling Services
21        Counseling Services
22    Anonymity and Education
23                      Other
24         Emergency Services
25                      Other
26                      Other
Name: Helpful_Support_Services_WebApp, dtype: object
```

In [ ]:

In [ ]:

```

```